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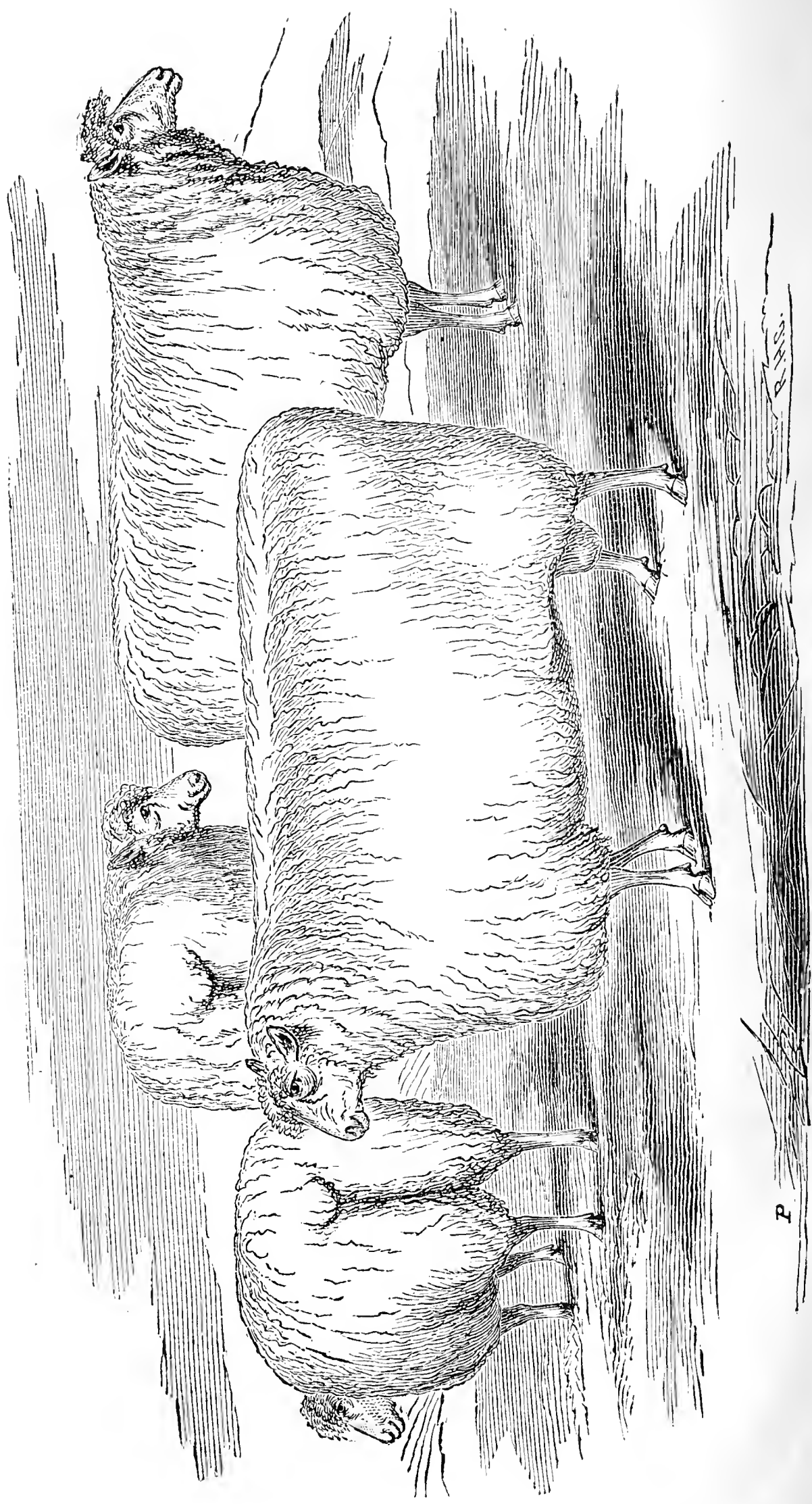


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TRANSACTIONS
OF THE
WISCONSIN
STATE AGRICULTURAL SOCIETY,
WITH TABULAR ABSTRACTS OF THE
REPORTS OF COUNTY AGRICULTURAL SOCIETIES,
SPECIAL REPORTS ON THE
INDUSTRY OF COUNTIES,
AND
VARIOUS IMPORTANT APPENDICES COMPILED FROM THE UNITED
STATES CENSUS.

Vol. IX, 1870.



PREPARED BY J. W. HOYT, SECRETARY.

MADISON, WIS.:
ATWOOD & CULVER, STATE PRINTERS.
1871.

PREFACE.

WHATEVER its faults and deficiencies,—and we are aware that it has both,—we send out this volume in the confident hope that the great variety and substantial value of its contents will commend it to the favor not only of those who desire reliable information concerning the various practical subjects therein discussed, but of all persons in any way interested in the industrial growth and prosperity of Wisconsin.

In the preparation of our own report upon the condition and progress of the State, great pains have been taken, by a protracted and laborious examination of the United States census returns, the use of which was kindly granted us by the Secretary of State, and by appeals to other public, and many private, sources of information, not only to make a document entirely worthy of public confidence, as authority on matters of fact, but also, by a logical and suggestive statement of the facts thus collected, to indicate the way to still greater improvement.

Under the head of “Essays” and “Communications,” the reader will find matter of great value. The illustrated paper on American Butter Factories and Butter Manufacture, by Prof. X. A. WILLARD, A. M., of New York, is alone worth to the public far more than the cost of the whole volume. The first portion of it was published, in much the same form, by the Royal Agricultural Society of England, in their Journal for 1870. The remainder is an entirely new contribution to this volume. The author has given many years to the advancement of the dairy business in this country, and, under a commission from the American Dairymen’s Association, has also devoted much time to its study in foreign countries. In view of the high opinion entertained of his investigations and

writings, both at home and abroad, it is but a modest claim that we make for him in saying, there is no higher authority on the subject of which he treats.

The numerous reports on the industry of counties will be esteemed by all who desire more specific and detailed information concerning these subdivisions of the State. That they were secured only after the most persistent effort and much vexatious delay in no way detracts from their real value, nor does it diminish our obligation to the several distinguished gentlemen who were finally induced to undertake their preparation. Their appearance in a somewhat condensed form and in smaller type than was deemed desirable was a necessity growing out of the limitations in space prescribed by the law providing for the annual printing and publication of the Society's Transactions.

The statistical appendices at the close of the volume present, in small compass, the result of several months of continuous labor. Showing the relative progress of the agricultural and manufacturing industry of the several counties, they cannot fail to interest all intelligent citizens in whatever section of the State, and at the same time prove a useful source of information to such persons in other States and foreign countries as may desire to make their future homes within our borders.

It was our purpose to include synopses of the annual reports of the State Horticultural Society and of the several district industrial associations of Wisconsin, but this was found impracticable.

The satisfactory manner in which the State Printers have executed the mechanical part of the work will appear at a glance. If the necessary absence of the Secretary at various stages of the printing has left the way open for a considerable number of typographical errors, which might otherwise have been excluded, it is hoped that none of them are of such importance as seriously to mar the general excellence of the volume.

J. W. H.

STATE AGRICULTURAL ROOMS, 1871.

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CONSTITUTION.

ARTICLE I.

OF THE NAME OF THE SOCIETY.

This society shall be known as the "Wisconsin State Agricultural Society." Its object shall be to promote the advancement of agriculture, horticulture, and the mechanical and household arts.

ARTICLE II.

OF THE MEMBERSHIP.

The society shall consist of life members, who shall pay, on subscribing, twenty dollars, and of honorary and corresponding members, who shall be elected by a two-thirds vote of the members of the executive board, at any regular meeting. The presidents of county agricultural societies shall be members *ex-officio*, entitled to the same privileges as life members, and together shall be known as the general committee of the society.

ARTICLE III.

OF THE OFFICERS.

The officers of this society shall consist of a president, one vice president for each congressional district of the state, a secretary, a treasurer, and seven additional members, who shall hold their respective offices for the term of one year from the first day of January next succeeding the date of their election, and until their successors shall have been elected, and all of whom, together with the ex-president latest in office, and the president and general secretary of the Wisconsin Academy of Sciences, Arts and Letters, shall constitute the executive board.

ARTICLE IV.

OF THE POWERS AND DUTIES OF OFFICERS.

The presidents and vice presidents shall perform such duties as are common to such officers in like associations, and as may be required by the executive board.

The secretary shall keep the minutes of all meetings, and have immediate charge of the books, papers, library, and collections, and other property of the society. He shall also attend to its correspondence, and prepare and

superintend the publication of the annual report of the society, required by law.

The treasurer shall keep the funds of the society and disburse the same on the order of the president, or a vice president, countersigned by the secretary, and shall make a report of all receipts and expenditures at the regular meeting of the society in November.

The executive board shall have power to make suitable by-laws to govern the action of the several members thereof. They shall have general charge of all the property and interests of the society, and make such arrangements for the holding and management of general and special exhibitions as the welfare of the society and the interests of industry shall seem to require.

The general committee shall be charged with the interests of the society in the several counties where they respectively reside, and constitute a medium of communication between the executive board and the public at large.

ARTICLE V.

OF MEETINGS AND ELECTIONS.

The annual meeting of the society, for the transaction of general business shall be held in its rooms in Madison, on the first Wednesday of December, at three o'clock P. M., in each year, and ten days notice thereof shall be given by the secretary, in one or more papers printed in the city of Madison.

The election of officers of the society shall be held each year during and at the general exhibition, and the exact time and place of the election shall be notified by the secretary in the official list of premiums and in all the general programmes of the exhibition.

Special meetings of the society will be called by order of the executive board, on giving twenty days' notice in at least three newspapers of general circulation in the state, of the time, place, and object of such meetings.

At any and all meetings of the society, ten members shall constitute a quorum for the transaction of business, though a less number may adjourn from time to time.

ARTICLE VI.

OF AMENDMENTS.

This constitution may be amended by a vote of two-thirds of the members attending any annual meeting; all amendments having been first submitted in writing at the previous annual meeting, recorded in the minutes of the proceedings, and read by the secretary in the next succeeding meeting for the election of officers.

LIFE MEMBERS.

NAME.	RESIDENCE.	NAME.	RESIDENCE.
Abbott, Chauncey..	New York.	Blanchard, Will'rd	Windsor.
Adams, Jas	Janesville.	Bliss, C. M.	Door Creek.
Adams, Isaac	Cottage Grove.	Blossom, Levi....	Milwaukee.
Adams, L. L.	Stoner's Prairie.	Bostwick, J. M. ...	Janesville.
Alexander, O.	Milwaukee.	Bostwick, Perry ..	Janesville.
Allen, Jas. W.	Janesville.	Bostwick, R. M. ...	Janesville.
Allen, W. C.	Delavan.	Bonnell, James...	Milwaukee.
Allen, H. M.	Evansville.	Boyce, A. A.	Vienna.
Allis, Edward P. ...	Milwaukee.	Boyd, R. B.	Milwaukee.
Angel, R. R.	Janesville.	Bowen, J. B.	Madison.
Atkins, Albert R. .	Milwaukee.	Bowman, J. M.	Madison.
Atwood, Chas. T. .	Madison.	Bradley, C. T.	Milwaukee.
Atwood, David	Madison.	Braley, A. B.	Madison.
Atwood, Wm. F. ...	Madison.	Brazea, Benj.	Wauwatosa.
Atwood, R. J.	Madison.	Briard, W. A.	Madison.
Armour, P. D.	Milwaukee.	Briggs, F.	Buffalo, N. Y.
Aspinwall, D. M. ...	Farmington.	Brockway, E. P. ..	Ripon.
Ayres, J. W.	Kenosha.	Brodhead, E. W. ..	Milwaukee.
Babbitt, Clinton...	Beloit.	Brown, Jas, J.	Madison.
Babbitt, D. H.	Janesville.	Brown, B. F.	Fitchburg.
Bacon, J. P.	Westport.	Brown, T.	Madison.
Bacon, W. D.	Waukesha.	Bruce, A. T.	Milwaukee.
Bailey, A. P.	Sun Prairie.	Bryan, Jno.	Cross Plains.
Bailey, M. T.	Madison.	Bryant, D. D.	Madison.
Barlass, Andrew ..	Emerald Grove.	Bryant, G. E.	Madison.
Barlass, David	Emerald Grove.	Bull, Stephen	Racine.
Barnes, George....	Janesville.	Bullard, Jas.	Evansville.
Barrows, E. S.	Janesville.	Bump, N. P.	Janesville.
Barry, James.	Fitchburg.	Bunker, Geo.	Madison.
Bates, A. C.	Janesville.	Burgess, J. M.	Janesville.
Beecroft, W. G.	Madison.	Bush, Sam'l.	Milwaukee.
Bement, E.	Oregon.	Button, Henry H. .	Milwaukee.
Bemis, Fred	Madison.	Burnham, Miles. .	Danville.
Bemis, Jarvis ...	Janesville.	Burnham, A., Jr. .	Milwaukee.
Benedict, J. D.	Bristol.	Burnham, J. L. ...	Milwaukee.
Benedict, S. G.	Providence, R. I.	Byrne, John A. ...	Madison.
Benedict, W. G.	Milwaukee.	Cæsar, Wm.	Janesville.
Bennett, A. A.	Grant Co.	Camp, H. H.	Milwaukee.
Benson, S. W.	Bloomfield.	Capron, Geo.	Madison.
Billings, Earl	Madison.	Carlton, W. D.	Sun Prairie.
Bird, I. W.	Jefferson.	Carpenter, J. A. ...	Waukesha.
Bird, T. E.	Madison.	Carpenter, J. E. ...	Windsor.
Bishop, John C.	Fond du Lac.	Carpenter, J. H. ...	Madison.
Black, John.	Milwaukee.	Carpenter, S. D. ..	Madison.
Blair, Franklin J. .	Milwaukee.	Carr, H. B.	Madison.

NAMES.	RESIDENCE.	NAMES.	RESIDENCE.
Carter, A. M.....	Johnstown.	Davis, S. B.....	Milwaukee.
Carter, Gray.....	Janesville.	Davis, W.....	Center.
Carver, P. S.....	Delavan.	Dean, E. B.....	Madison.
Case, J. I.....	Racine.	Dean, N. W.....	Madison.
Chandler, Sam'l...	Milwaukee.	Dean, John S....	Madison.
Chappinan, T. A...	Milwaukee.	Delamater, W. A.	Mazomanie.
Chapman, C. R....	Liecester.	Delaplaine, G. P..	Madison.
Chase, Enoch.....	Milwaukee.	Dewey, Nelson...	Lancaster.
Chase, H.....	Milwaukee.	Dewolf, E.....	Madison.
Cheney, Rusus....	Whitewater.	Devoe, A. B.....	Madison.
Child, Jno.....	Lima Centre.	Dexter, W. W....	Janesville.
Children, E.....	Lancaster.	Dickerman, I. A..	Verona.
Chipman, A.....	Sun Prairie.	Dixon, J. P.....	Janesville.
Church, Wm. W...	Madison.	Dodge, J. E.....	Potosi.
Clapp, G. W.....	Fitchburg.	Doolittle, W. J....	Janesville.
Clark, C. M.....	Whitewater.	Doris, John.....	Milwaukee.
Clark, Lewis.....	Beloit.	Dorn, M. M.....	Madison.
Clark, Saterlee...	Horicon.	Doty, E. P.....	Janesville.
Cochrane, John....	Waupun.	Dousman, J. B...	Milwaukee.
Cogswell, A. W....	Brookfield.	Dousman, T. C...	Waterville.
Colby, Charles....	Janesville.	Dow, O. P.....	Palmyra.
Coleman, W. W...	Milwaukee.	Drakely, S.....	Madison.
Colladay, Wm. M..	Stoughton.	Drury, E. W.....	Fond du Lac.
Colton, S. B.....	Madison.	Dunlap, S.....	Burk.
Cornell, James....	Beloit.	Dunn, And.....	Portage City.
Cornwell, H. H....	Verona.	Dunn, Wm.....	Madison.
Corrigan, Jno.....	Cedarburg.	Dunning, Abel...	Madison.
Cottrill, J. P. C....	Milwaukee.	Durkee, H.....	Konosha.
Cottrill, W. H.....	Milwaukee.	Dutcher, J. A....	Milwaukee.
Cottrill, C. M.....	Milwaukee.	Dwinnell, J. B....	Lodi.
Cory, J.....	Footville.	Eaton, J. O.....	Lodi.
Crampton, N. B...	Verona.	Echlin, J. O.....	Janesville.
Crawford, E. B....	Omaha.	Edgerton, E. W...	Summit.
Crawford, J. B....	Baraboo.	Edmunds, F. W...	Madison.
Crawl, Jno.....	Center.	Elderkin, Ed.....	Elkhorn.
Crocker, Hans.....	Milwaukee.	Elliott, E.....	Lone Rock.
Crosby, J. B.....	Janesville.	Elliot, Jos. T....	Racine.
Cross, J. B.....	Milwaukee.	Elmore, A. E.....	Mukwnoago.
Crossitt, B. F.....	Janesville.	Ellis, J. A.....	Madison.
Culver, Galeb E...	Shopiere.	Ellsworth, O.....	Milwaukee.
Cummings, Wm...	Fitchburg.	Ellsworth, W. J..	Madison.
Curtis, F. C.....	Rocky Run.	Elmore, R. P.....	Milwaukee.
Curtis, Seymour...	Fitchburg.	Eldred, Jno. E....	Milwaukee.
Cutting, J. W.....	Harmony.	Emmons, N. J....	Milwaukee.
Dagget, M. L.....	Madison.	Enos, Eliha.....	Waukesha.
Dahlman, Anthony.	Milwaukee.	Esterly, Geo. W..	Whitewater.
Dahlman, John....	Milwaukee.	Fairbanks, E.....	St. Johnsbury Vt
Dann, Obed.....	Janesville.	Farwell, L. J.....	Chicago.
Danks, E. P.....	Stoughton.	Fenn, G. W.....	Janesville.
Daniells, W. W...	Madison.	Ferguson, D.....	Milwaukee.
Darling, K. A.....	Fond du Lac.	Ferguson, Benj...	Fox Lake.
Darwin, A. G.....	Brooklyn, N. Y.	Fernly, Jno.....	La Grange.
Davidson, Adam...	Verona.	Field, Martin.....	Mukwanago.
Davis, G. L.....	Milwaukee.	Field, W. W.....	Boscobel.
Davis, Jno.....	Milwaukee.	Fifield, L.....	Janesville.
Davis, N. P.....	Pierceville.		

NAME.	RESIDENCE.	NAME.	RESIDENCE.
Fifield, D. E.	Janesville.	Grover, E.	Madison.
Fifield, E. G.	Janesville.	Grubb, W. S.	Madison.
Finch, Lorin.	Bradford.	Guernsey, Orrin ...	Janesville.
Firman, F. H.	Madison.	Gurnee, J. D.	Madison.
Fisher, C. C.	Center.		
Fisher, Elijah.	Newark.	Haight, J. M.	Sacramento, Cal.
Eisher, S. W.	Center.	Haight, Nicholas.	Madison.
Fisher, Seth.	Center.	Hall, Augustus ...	Janesville.
Fitch, D.	Madison.	Hallock, Youngs..	Middleton.
Fitch, W. F.	Madison.	Hall, H. B.	Madison.
Fitch, W. G.	Milwaukee.	Hanchett, A. M. ...	Hanchetville.
Fitzgerald, R. P.	Milwaukee.	Hancock, Brad ...	Marshall.
Fletcher, John.	Springfield.	Hammond, L. M. ...	Madison.
Flint, J. G., Jr. ...	Milwaukee.	Hammond, E. S. ...	Fond du Lac.
Folds, Geo. H.	Madison.	Harrington, N. H.	Delavan.
Foote, E. A.	Footville.	Harris, Jas.	Janesville.
Foote, Sidney.	Madison.	Harvey, J. W.	Madison.
Fowler, Jacob.	Oshkosh.	Hasbrouk, W. H. ...	Madison.
Fowler, James S. ...	Milwaukee.	Hastings, S. D.	Madison.
Fox, W. H.	Fitchburg.	Hausman, Jos.	Madison.
Fratt, N. D.	Racine.	Hawes, J. F.	Madison.
Frank, A. S.	Madison.	Hawes, W. N.	Verona.
Freidman, Ignatius.	Milwaukee.	Helfenstein, J. A. ...	Milwaukee.
French, Jonathan. ...	Madison.	Hempstead, H. W.	Milwaukee.
Fuller, M. E.	Madison.	Hicks, J. H.	Oshkosh.
Fuller, F. D.	Madison.	Hibbard, W. D. ...	Milwaukee.
Furlong, Thos. T. ...	Janesville.	Hibbard, Wm. B. ...	Milwaukee.
Furlong, John.	Milwaukee.	Higbee, A. T.	Stoughton.
		Hill, H. J.	Madison.
		Hill, James H.	Madison.
Gammons, Warran.	Middleton.	Hill, J. W. P.	Windsor.
Gates, D. W. C.	Madison.	Hill, P. B.	Milwaukee.
Gaylord, Aug.	Milwaukee.	Hill, Robt.	Milwaukee.
Gernon, George.	Madison.	Himer, A. M.	Milwaukee.
Gibbs, Chas R.	Whitewater.	Hiner, W. H.	Fond du Lac.
Gilbert, Thomas. ...	Oregon.	Hinkley, B. R.	Sumitt.
Giles, H. H.	Madison.	Hobart, L. J.	Milwaukee.
Gilman, Henry.	Madison.	Hodge, Robt.	Janesville.
Gillette, R. E.	Tomah.	Hodson, C. W.	Janesville.
Goodenow, H. D. ...	Blooming Grove	Hoeffinger, Carl ...	Wausau.
Goodrich, Ezra.	Milton.	Hogan, Gilbert. ...	Janesville.
Goodrich, G.	Whitesville.	Hollister, R. M. ...	Janesville.
Gould, L. D.	Madison.	Holmes, A. M.	Milwaukee.
Grady, F. M.	Fitchburg.	Holt, David.	Madison.
Graham, Alex.	Janesville.	Holton, Edward D	Milwaukee.
Grant, S. B.	Milwaukee.	Hopkins, Bedford B	Milwaukee.
Grant, Albert.	Milwaukee.	Hopkins, James. ...	Madison.
Graves, R. A.	Ripon.	Hopkins, J. C.	Madison.
Graves, S. W.	Rutland.	Hoskins, J. W.	Milwaukee.
Green, Anthony.	Milwaukee.	Hoyt, J. W.	Madison.
Green, Geo. G.	Milwaukee.	Hughes, Wheldon	Janesville.
Green, H. S.	Milford.	Hume, W. M.	Janesville.
Green, Samuel.	Fitchburg.	Hulbert, E.	Oconomowoc.
Greenman, C. H. ...	Milton.	Huston, Sol.	Janesville.
Gregory, J. C.	Madison.	Hyde, Edwin.	Milwaukee.
Grinnell, J. G.	Adams.		
Groom, John.	Madison.	Ilsley, Chas. F. ...	Milwaukee.

NAMES.	RESIDENCE.	NAMES.	RESIDENCE.
Inbusch, J. H.	Milwaukee.	Lindsey, E. J.	Milwaukee.
Ingham, A. C.	Madison.	Little, Thos. H. ...	Janesville.
Jackman, Hiram. ...	Janesville.	Lloyd, Lewis.	Cambria.
Jacobs, H. C.	Janesville.	Lockwood, Jno. ...	Milwaukee.
Jenks, S. R.	Madison.	Ludington, H.	Milwaukee.
Jenkins, J. C.	Janesville.	Ludington, James. .	Milwaukee.
Jerdee, L. P.	Madison.	Ludlow, A.	Monroe.
Jerdee, M. P.	Madison.	Lucy, O. K.	Columbus.
Johnston, Jno. Jr. .	Madison.	Lyman, L. H.	Palmyra.
Johnson, J. C.	Leyden.	Lynch, T. M.	Janesville.
Johnson, M. B.	Janesville.	Lynde, W. P.	Milwaukee.
Johnson, John.	Milwaukee.	Main, Alex. H.	Madison.
Johnston, Hugh L. .	Milwaukee.	Mann, I. L.	Fitchburg.
Johnston, John.	Milwaukee.	Mann, J. E.	Madison.
Jones, C. H.	Sun Prairie.	Mann, Henry.	Milwaukee.
Jones, John N.	Madison.	Macy, J. B.	Fond du Lac.
Juneau, Paul.	Juneau.	Manwaring, Wm. .	Black Earth.
Janssen, E. H.	Mequon.	Marshall, Sam'l. ...	Madison.
Kellogg, L. F.	Madison.	Martin, A. C.	Ashton.
Kellogg, L. H.	Milwaukee.	Martin, C. L.	Janesville.
Keimert, Emil.	Milwaukee.	Martin, Nath'l.	Monroe.
Keyes, E. W.	Madison.	Martin, S. W.	Madison.
Kent, A. C.	Janesville.	Mason, Geo. A.	Madison.
Kershaw, C. J.	Milwaukee.	Masters, E. D.	Jefferson.
Kimball, M. G.	Madison.	Mathews, A. K.	Milwaukee.
Kimball, John.	Janesville.	Matteson, Clinton. .	Rosendale.
Kingsley, S. P.	Springfield.	Maxson, O. F.	Waukegan.
Kingston, J. T.	Necedah.	May, A. C.	Milwaukee.
Kiser, Wm. C.	Madison.	Mayhew, T. J.	Milwaukee.
Klauber, Samuel. .	Madison.	Mayhew, J. L.	Milwaukee.
Knight, E.	Sun Prairie.	McCarty, F. D.	Fond du Lac.
Kneeland, Moses. .	Milwaukee.	McConnell, T. J. ...	Madison.
Kneeland, James. .	Milwaukee.	McCormick, J. G. .	Madison.
Knowles, Geo.	Milwaukee.	McCollough, And. .	Emerald Grove.
Knapp, J. G.	Madison.	McDill, A. S.	Westport.
Koss, Rudolph.	Milwaukee.	McDonald, A.	Alloa.
Ladd, M. L.	Sugar Creek.	McDougal, Geo. W. .	Madison.
Lamb, F. J.	Madison.	McGach, P.	Milwaukee.
Landaur, Max.	Milwaukee.	McIndoe, W. D. .	Wausau.
Lapham, I. A.	Milwaukee.	McKenna, Martin. .	Madison.
Larkin, B. F.	Madison.	McKenna, David. .	Madison.
Larkin, C. H.	Madison.	McLaren, Wm. P. .	Milwaukee.
Larkin, Daniel.	Milwaukee.	McNiel, David.	Stoughton.
Larkin, Wm.	Madison.	McGregor, Alex. ...	Nepeuskin.
Lawrence, W. A. ...	Janesville.	McPherson, J. P. .	Springdale.
Lawton, J. G.	Green Bay.	Mears, Wm. A.	Madison.
Learned, J. M.	Janesville.	Merrill, Alf.	Madison.
Leiedersdorf, B.	Milwaukee.	Merrill, S. S.	Milwaukee.
Leitch, W. T.	Madison.	Miller, John.	Madison.
Lietch, W. T. Jr. ...	Madison.	Mills, Simeon.	Madison.
Leslie, Jno.	Madison.	Miltimore, Ira.	Janesville.
Lester, Waterman. .	Janesville.	Miner, Cyrus.	Janesville.
Lewis, Herbert A. .	Madison.	Miner, Jno. B.	Milwaukee.
Lewis, Jno. L.	Madison.	Mitchell, Alex.	Milwaukee.
		Mitchell, J. L.	Milwaukee.
		Morden, Ed.	Madison.

NAMES.	RESIDENCE.	NAMES.	RESIDENCE.
Morehouse, L. H. . .	Milwaukee.	Power, D. G.	Milwaukee.
Morse, Samuel	Milwaukee.	Powers, D. J.	Madison.
Moseley, G. F.	Janesville.	Powers, Wm. J. . . .	Black Earth.
Mosher, J. C.	Lodi.	Pratt, E. E.	Chicago.
Moxley, A. R.	Madison.	Pres't St. Peter's	
Mullen, James.	Milwaukee.	Val. Farm's Club	Springfield.
Murray, Geo.	Racine.	Pritchard, P. M. . . .	Fitchburg.
		Proudfit Andrew. . .	Madison.
Nash, C. D.	Milwaukee.		
Nazro, John.	Milwaukee.	Rawson, C. S.	Madison.
Needham, J. P.	Wauwatosa.	Ray, Charles	Milwaukee.
Newcomb, S. B.	Cold Spring.	Raymond, S. O.	Geneva.
Newton, Ephraim . .	Oregon.	Reardon, Charles . .	Janesville.
Newton, I. S.	Middleton.	Reed, Herbert.	New York.
Nichols, L. T.	Janesville.	Reed, Harrison. . . .	Jacksonville, Fl.
Norris, C. W.	Milwaukee.	Resague, A. C.	Janesville.
Norton, J. B.	Madison.	Reynolds, M.	Madison.
Nott, B. F.	Oregon.	Reynolds, John. . . .	Madison.
		Reynolds, Thomas . .	Madison.
Ober, R. P.	Milwaukee.	Reynolds, John. . . .	Kenosha.
Olney, C. W.	Madison.	Rexford, S. D.	Janesville.
Orr, G. H.	Verona.	Rice, E. M.	Whitewater.
Ott, Geo. V.	Madison.	Richards, Richard . .	Racine.
		Richardson, D.	Middleton.
Paddock, Geo.	Milwaukee.	Richardson, James . .	Buffalo, N. Y.
Page, H. M.	Madison.	Richardson, R. J. . . .	Janesville.
Palmer, H. L.	Milwaukee.	Richardson, H.	Janesville.
Palmer, J. Y.		Richmond, Amaz'h . .	Whitewater.
Palmer, O. M.	Oregon.	Riebsam, C. R.	Madison.
Park, John W.	Vernon.	Rizer, J. O.	Oregon.
Park, Wm. J.	Madison.	Ribbins, J.	Vienna.
Parker, C. H.	Beloit.	Robbins, J. V.	Madison.
Parmley, Ira	Center.	Roddiss, R.	Milwaukee.
Palmer, Henry	Oregon.	Rodermund, John. . .	Madison.
Parsons, P. B.	Madison.	Rodgers, Lawrence . .	Westport.
Partridge, J. S.	Whitewater.	Roe, J. P.	Franklin.
Patten, L. F.	Janesville.	Rogers, C. H.	Milwaukee.
Patton, Jas. E.	Milwaukee.	Rogers, J. S.	Burlington.
Payne, Wm.	Janesville.	Rogers, Anson.	Janesville.
Peffer, G. P.	Pewaukee.	Ross, James.	Madison.
Pember, R. T.	Janesville.	Rowe, Richard W. . . .	Madison.
Perkins, P. M.	Burlington.	Rowe, W. E.	Mazomanie.
Perrine, L. W.	Janesville.	Rowley, N. C.	Verona.
Perry, B. F.	Milwaukee.	Ruble, Simon	Beloit.
Pfister, Guido	Milwaukee.	Ruggles, J. D.	San Francisco.
Phelps, A. Warren. .	Milwaukee.	Russell, Harvey. . . .	Milwaukee.
Pierce, C. L.	Milwaukee.		
Pinney, S. U.	Madison.	Sage, E. C.	New Lisbon.
Pinckney, B.	Fond du Lac.	Salisbury, R. W. . . .	Fitchburg.
Plankinton, John . .	Milwaukee.	Salisbury, D. F. . . .	Fitchburg.
Plumb, J. C.	Milton.	Sanderson, Edw. . . .	Milwaukee.
Plumb, T. D.	Madison.	Sanderson, R. B. . . .	Madison.
Plumer, B. G.	Wausau.	Schute, Charles	Milwaukee.
Pond, Samuel A. . . .	Albany.	Schutt, U.	Janesville.
Porter, Wm. F.	Madison.	Scollan, Frank.	Madison.
Porter, Wm. H.	Madison.	Scott, S. B.	Milwaukee.
Post, David T.	Milwaukee.	Seville, James.	Merrimac.

NAME.	RESIDENCE.	NAME.	RESIDENCE.
Sexton, Kellogg ...	Milwaukee.	Tallman, W. H ...	Janesville.
Simmons, C. J.	Monroe.	Taylor, E.	Mukwanago.
Sinclair, Jeff.	Milwaukee.	Taylor, W. R.	Cottage Grove.
Sharp, J. W.	Cottage Grove.	Tenney, H. A.	Madison.
Shaw, J. B.	Milwaukee.	Tenney, D. K.	Chicago, Ill.
Sheldon, A. H.	Madison.	Terry, F. H.	Milwaukee.
Shepherd, C.	Milwaukee.	Terwilliger, Jas. ..	Syene.
Sheldon, D. G.	Madison.	Thorsen, John.	Milwaukee.
Sheldon, S. L.	Madison.	Tibbitts, Geo. M. ..	Milwaukee.
Sherman, Adelmorn	La Prairie.	Tierney, K.	Madison.
Sherman, Amaziah.	La Prairie.	Thomas, M. J.	Fond du Lac.
Sherman, Geo.	La Prairie.	Thompson, W. H. ..	Chicago, Ill.
Sherman, J. M.	Burnett.	Thompson, Dr. W. ..	Madison.
Sherwood, J. C.	Dartford.	Thorp, J. G.	Eau Claire.
Shipman, S. V.	Madison.	Throop, B.	Milwaukee.
Chipman, A. C.	Sun Prairie.	Todd, J. G.	Janesville.
Skelley, Chas.	Janesville.	Tolford, J. W.	Madison.
Skinner, Geo. J.	Madison.	Torgerson, Lars. ..	Madison.
Skinner, E. W.	Madison.	Townley, John.	Moundville.
Slaughter, G. H.	Middleton.	Treat, R. B.	Janesville.
Slaughter, W. B.	Middleton.	True, W. H.	Fitchburg.
Sloan, I. C.	Janesville.	Twining, M. S.	Magnolia.
Slocum, G. A.	Janesville.	Utter, Jas.	Oregon.
Smith, Angus.	Milwaukee.	Van Cott, Albert B.	Milwaukee.
Smith, Adam.	Burke.	Van Etta, Jacob. ..	Madison.
Smith, Geo. B.	Madison.	Van Kirk, N.	Milwaukee.
Smith, J. B.	Milwaukee.	VanNorstrand, A. H.	Green Bay.
Smith, S. W.	Janesville.	Van Slyke, N. B. ..	Madison.
Smith, H. L.	Janesville.	Vaughn, O. A.	Lodi.
Smith, M. C.	Janesville.	Viall, Andrus.	Madison.
Smith, S. B.	Vernon.	Vilas, Chas. H.	Madison.
Smith, J. Morris.	Janesville.	Vilas, Henry.	Madison.
Snell, H.	Madison.	Vilas, L. B.	Madison.
Spaulding, Wm.	Janesville.	Vilas, L. M.	Madison.
Spaulding, Jos.	Janesville.	Vilas, Wm. F.	Madison.
Spencer, Jas. C.	Milwaukee.	Wackerhagen, E. ..	Racine.
Spencer, R. C.	Milwaukee.	Wait, J. B.	Waitsville.
Squire, Thos. H.	Waterloo.	Warren, J. H.	Albany.
Stannard, A. C.	Milton.	Warren, W. R.	Madison.
Stark, Chas. A.	Milwaukee.	Webster, James. ..	Danville.
Steele, Chester.	Milwaukee.	Webster, Martin. ..	Fox Lake.
Stevens, Geo. C.	Milwaukee.	Weed, Charles.	Madison.
Stevens, J. T.	Madison.	Webb, James A.	Janesville.
Steensland, H.	Madison.	Welch, W.	Madison.
Stewart, C. K.	Danville.	Werner, John.	Sauk.
Stewart G. H.	Beaver Dam.	West, Henry.	Madison.
Stilson, Eli.	Oshkosh.	S. C. West.	Milwaukee.
St. John, J. W.	Janesville.	West, Henry H.	Milwaukee.
Stockman, John.	Milton.	Whaling, J. M.	Milwaukee.
Stone, G.	Beloit.	Wheeler, Guy.	La Prairie.
Storm, Wm.	Madison.	Wheeler, W. A.	Madison.
Stowe, Lafayette. ..	Sun Prairie.	Wheeler, L. A.	Milwaukee.
Sullivan, Jas.	Burke.	Wheelock, W. G.	Janesville.
Sutherland, C.	Syene.	Wheelright, J.	Middleton.
Swain, Wm. W.	Verona.		
Tallmadge, John J. ..	Milwaukee.		

NAME.	RESIDENCE.	NAME.	RESIDENCE.
White, A.....	Verona.	Wilson, Wm.	Westport. !
White, W. A.	Madison.	Wilson, H. O.....	Milwaukee.
Whiting, W. F.....	Milwaukee.	Wilson, Sebina...	Palmyra.
Wightman, H.	Black Earth.	Wolcott, E. B. ...	Milwaukee.
Wilcox, C. F.	Janesville.	Wooley, J. T.	Milwaukee.
Wilkins, A. W. ...	Milwaukee.	Wootton, Robert .	Madison.
Willey, O. S.....	Madison.	Worthington, B.M.	Madison.
Williams, C. L.....	Madison.	Worthington, D...	Madison.
Williams, C. H. ...	Baraboo.	Wright, D. H.....	Madison.
Williams, D.....	Darien.	Wright, Geo.....	Mt. Horeb.
Williams, Daniel..	Madison.	Wright, J. S.	Emerald Grove.
Williams, G. G. ...	Whitewater.	Wright, Josiah T.	Janesville.
Williams, J. P.....	Madison.	Wright, N. A.....	Prairie du Chien
Williams, Randall.	Janesville.	Wylie, Geo. W. ...	Elkhorn.
Williams, S. B.....	Madison.		
Williams, S. G.....	Janesville.	Young, J. E.	Harmony.

TRANSACTIONS.

ANNUAL REPORT.

His Excellency, LUCIUS FAIRCHILD,

Governor of Wisconsin:

SIR:—The rapid increase of the United States in wealth and population makes the year of the decennial census one of very great interest.

From the nature of the circumstances under which any census must be taken, absolute correctness is, of course, impossible. Still, the returns are an important approximation to the real facts; and since the average of the circumstances of one census-taking will be about as favorable to correctness as those of another, the results serve all the purposes of a comparison, which is the chief end of their collection. If they do not give us with certainty the exact population at any one period, the number of acres of land under cultivation, the total acreage of the various crops, the average yield, or total product of each, they do enable us to learn whether the ratio of increase has advanced or diminished; whether agriculture has continued to engage the energies of its former proportion of the population, and if so, to what particular branch they have been most devoted, and in which they have attained the most satisfactory results. If they fail to inform us of the precise number of persons and the amount of capital engaged in working our mines, in the business of manufacture, and in the various

mercantile pursuits, they nevertheless show us, if we will make the comparisons, which one of these great interests has advanced the most rapidly and yielded the most important results. Furthermore, if any branch of industry, important in itself, has lagged or pined, statistics may aid us in determining the cause, and appointing the remedy. At all events this is their office, and herein they constitute the basis of political science.

To the newer states they not only serve the various purposes above named, but are also of great interest as showing to each of them in what ratio they have advanced toward the front rank, and whether they have kept pace with their competitors.

For these reasons, we shall gladly avail ourselves of the opportunity afforded by the census of 1870 for so far enlarging the scope of the report of the Wisconsin State Agricultural Society for that year, as to embrace such statistical comparisons of the present with the past as appear to be important to the industrial interests of the state.

If Wisconsin has not made an unprecedented growth, it is not because of any lack in the natural advantages for which the state is so justly distinguished, but solely because there has been less than a just appreciation of the means elsewhere employed to increase immigration and to secure the capital requisite to the success of our several productive industries. Let us see.

POPULATION.

The first census in which Wisconsin figured was that of 1840, when, as a territory, it had a population of 30,945.

In 1850, two years after its admission into the Union, it had 305,391 inhabitants; having made a gain of 886.88 per cent. It then ranked the twenty-fifth state in point of population.

In 1860, it numbered 775,881 inhabitants, and took rank as the fifteenth state; the ratio of increase between 1850 and 1860 having been 154.06 per cent.

In 1870, it had reached a population of 1,055,559, the ratio of increase having been 36.06 per cent. Its present rank among the states is that of the fourteenth.

The relative increase and the ratio of increase of population in several of the other northwestern states, between 1860 and 1870, will be interesting, as showing the states toward which the tide of immigration has had the fullest flow. In making these comparisons, it should be borne in mind, however, that the *ratio* of increase is always much higher in the early history of every state than after a period of years. The actual increase will be a better test of development in the case of states widely apart, or even ten years apart, in the date of their organization.

TABLE showing increase of Population, and Rates of Increase, in eight of the Northwestern States.

STATES.	Population in 1860.	Population in 1870.	Actual increase.	Rate of increase.
Wisconsin.....	775,881	1,055,559	279,578	36.04
Missouri.....	1,182,012	1,715,000	532,988	45.00
Illinois.....	1,711,951	2,539,638	827,687	48.34
Michigan.....	749,113	1,184,296	435,183	58.09
Iowa.....	674,913	1,040,819	433,906	64.27
Minnesota.....	177,022	440,076	268,045	155.82
Kansas.....	107,206	362,872	255,668	238.48
Nebraska.....	28,841	123,300	94,159	326.47

It is not surprising that there should have been so great a difference in the *ratio* of increase between Wisconsin and the states more recently organized. But the very considerable difference between our state and Iowa and Michigan, in both the actual increase and the increase per cent., which for some time have run nearly together, is a matter that should have our serious attention.

During her early career and the period of her greatest growth, Wisconsin advanced with more rapid strides than any of the other states in corresponding periods, except Minnesota, as will appear from the following comparisons:

COMPARATIVE TABLE *showing Ratio of Increase per cent.*

STATES.	Years.	Ratio of increase per cent.
Iowa.....	from 1840 to 1850.....	347
Illinois.....	from 1810 to 1820.....	350
Ohio.....	from 1800 to 1810.....	408
Indiana.....	from 1810 to 1820.....	510
Michigan.....	from 1830 to 1840.....	575
Wisconsin.....	from 1840 to 1850.....	886

The facilities for immigration were very much greater between 1840 and 1850 than they were between 1810 and 1820, when Indiana and Illinois had their greatest growth, and have been still greater since, to the advantage of the states younger than Wisconsin; but no explanation based upon this or any such ground will account for our present falling off. Shall we not be honest with ourselves and charge it upon our lack of foresight and enterprise?

The distribution of the population by counties, and the increase made by each, are presented in the following table:

TABLE *showing the Population of Wisconsin in the years 1850, 1860 and 1870, by counties:*

COUNTIES.	1850.	1860.	1870,
Adams	187	6,492	6,713
*Ashland		515	221
Barron		13	538
*Bayfield		353	344
Brown.....	6,215	11,795	25,180
Buffalo		3,864	11,123
Burnett.....		12	706
Calumet.....	1,743	7,895	12,334
Chippewa.....	615	1,895	5,635
Clark.....		789	3,446
Columbia	9,565	24,441	28,769
Crawford	2,498	8,068	13,117
Dane	16,639	43,922	53,109
Dodge	19,138	42,818	47,140
Door		2,948	4,869
Douglas		812	1,132
Dunn.....		2,704	9,491
Eau Claire.....		3,162	10,782
Fond du Lac.....	14,510	34,154	46,292

*Ashland and Bayfield, together known in 1850 as La Pointe, then had a population of 489, which number is included in the total of that year.

TABLES showing the Population of Wisconsin, etc.—continued.

COUNTIES.	1850.	1860.	1870.
Grant	16,169	31,189	37,975
Green	8,566	19,808	23,609
Green Lake		12,663	13,287
Iowa	9,525	18,967	24,555
Jackson		4,170	7,712
Jefferson	15,317	30,438	34,050
Juneau		8,770	12,396
Kenosha	10,734	13,900	13,177
Kewaunee		5,530	19,281
La Crosse		12,186	20,295
La Fayette	11,531	18,134	22,667
Manitowoc	3,702	22,416	33,369
Marathon	508	2,892	5,885
Marquette	8,641	8,233	8,057
Milwaukee	31,077	62,518	89,936
Monroe		8,410	16,552
Oconto		3,592	8,322
Outagamie		9,587	18,440
Ozaukee		15,682	15,579
Pepin		2,392	4,659
Pierce		4,672	10,003
Polk		1,400	3,422
Portage	1,250	7,507	10,640
Racine	14,973	21,360	26,742
Richland	903	9,732	15,736
Rock	20,750	36,690	39,039
St. Croix	624	5,392	11,039
Sauk	4,371	18,963	23,868
Shawano		829	3,165
Sheboygan	8,379	26,875	31,773
Trempealeau		2,560	10,728
Vernon		11,007	18,673
Walworth	17,862	26,496	25,992
Washington	19,485	23,622	23,905
Waukesha	19,258	26,831	28,258
Waupaca		8,851	15,533
Waushara		8,770	11,379
Winnebago	10,165	23,770	37,325
Wood		2,425	3,911
Total	305,391	775,881	1,052,875

The actual growth, in population, of certain districts of the state will not correctly appear from the above table, unless it be borne in mind that, whereas in 1850 there were but thirty-one counties embraced, there are now fifty-eight. This will not only account for the several blanks in the column of 1850, but likewise for the apparent, very moderate increase, in the case of Marquette, Brown, St. Croix and some other counties,

which, since the date of the census of 1850 have been divided up into two or more counties, afterwards credited in their own name with quite large populations occupying the self-same territory formerly embraced in one county.

Unfortunately we are without the means of determining accurately just what proportion of this large increase of population have taken part in the productive industries of this state during the past ten years, and how many have been added by birth within the state. But, judging from the fact that the natives of other states and countries have had a large preponderance over those born within the state, at the date of the census of 1850 and that of 1860, it may be inferred that more than half of the 279,678 persons added to the population of 1860 were immigrants from the states further east and from Europe. And since a large share of those who come to us from without are of such age as to enable them to engage in some branch of industry, the wealth-producing capacity of this increase may be safely estimated at \$100,000,000; to which may be added a large amount for the cash capital actually brought to the state, and by them invested in various enterprises that will further add to our rapidly increasing wealth.

THE OCCUPATIONS OF OUR PEOPLE.

If we inquire, in the next place, what motives have actuated the multitudes who have come among us during the last decade, and what industries have commanded the energies of the whole population; what proportion have congregated in cities and villages; how many have sought for wealth in our mines; how many have preferred the cultivation of the soil; the proportion devoted to the mechanic arts, to commerce, to the professions; and how many are properly classed as common laborers, doing the work assigned them by others, we shall obtain results of much interest.

In the first place we shall find that the increase of population in the leading cities and villages has been greater than in the country districts; showing one of two things—either that

there is a growing indisposition toward the work of the farm and the quietness of life in the country, or that a larger proportion of those who come to us from other parts of the country and from the old world have been attracted hither by certain superior advantages our state presents over many others for pursuits other than agriculture.

For the purpose of settling this question approximately,* we have ascertained the population of some thirty-six of the leading towns and villages in 1850, 1860 and 1870. Others might have been included in our calculation, but these were deemed sufficient. They were taken at random, except that we have intended that they should represent all sections of the state.

TABLE showing the Population, at different periods, of several leading Cities and Villages of Wisconsin.

PLACE.	1850.	1860.	1870.
Appleton.....		2,345	4,521
Beloit.....	2,732	4,098	4,398
Beaver Dam.....	1,499	2,765	3,264
Boscobel.....		665	1,509
Berlin.....	1,061	1,449	2,778
Chippewa Falls.....		753	2,510
Columbus.....	672	1,188	1,888
Delavan.....		1,549	1,688
Dodgeville.....	2,117	2,181	1,407
Eau Claire.....		1,264	5,062
Fort Howard.....		694	2,461
Fond du Lac.....	2,014	5,450	12,765
Fox Lake.....		1,461	1,086
Green Bay.....	1,923	2,275	4,666
Hudson.....		1,560	1,748
Janesville.....	3,335	7,703	8,789
Jefferson.....	550	1,466	2,177
Kenosha.....	3,455	3,990	4,308
La Crosse.....		3,860	9,280
Madison.....	1,525	6,611	9,173
Monroe.....	1,146	2,170	3,404
Mineral Point.....	2,584	2,289	3,276
Milwaukee.....	20,361	45,246	71,461
Oshkosh.....	702	6,086	12,673
Prescott.....		1,031	1,145
Portage.....	1,175	2,879	3,985
Prairie du Chien.....		2,398	3,661

* From the census of 1850 it is sometimes quite impossible, where the name of a village or city is identical with that of the township in which it is located to decide whether the figures are intended to represent the population of the city merely, or that of the township the city included.

TABLE showing the Population, at different periods, etc.—continued.

PLACE.	1850.	1860.	1870.
Platteville	2,171	2,865	2,537
Ripon	356	2,035	2,977
Racine	5,107	7,822	9,881
Stevens Point.....		1,533	1,810
Sheboygan		4,262	5,310
Watertown	1,451	5,302	7,555
Waupun.....		865	1,936
Wausau		543	1,349

From the foregoing table, it will appear that the ratio of increase in the population of Wisconsin cities and villages between 1860 and 1870 was not 36 per cent.—the ratio for the whole state—but considerably more than this, nearly 45 per cent.

It is worthy of mention that, although the selection of villages has been made impartially, choice has naturally fallen upon those which are more thriving and hence more prominent. It is quite likely, that if *all* the villages of the state were embraced in the calculation, the ratio would fall considerably below 45 per cent.

Indeed it is probable that if the great number of very small villages, so located as to make growth very difficult, were grouped together, the ratio would fall quite below 36—in other words that the balance between the industries of the villages and of the rural districts has not been so far disturbed as would at first appear.

This view is confirmed by the following figures, showing that the increase in the case of some has been very much greater than 45 per cent :

RATIO of Increase in the Population of certain Cities and Villages of Wisconsin between 1860 and 1870.

	Per cent.
Milwaukee	58
Green Bay, over.....	100
Oshkosh, over	100
Fond du Lac	134
Wausau	148
Chippewa Falls.....	233
Eau Claire	308

It is further confirmed by statistics showing the distribution of the population by occupations, with the rate per cent. of increase.

Let us now inquire into the results of the industry of these thousands of farmers, miners, lumbermen, mechanics and merchantmen—into the progress and condition of the several important state interests they represent.

THE PROGRESS OF AGRICULTURE.

Although the industry of Wisconsin is more varied than that of some other western states, such as Iowa and Minnesota, in which mining, lumbering, manufacturing and interstate commerce play an important part, we are nevertheless able to show results in agriculture that compare quite favorably, in most respects, with those of the states mentioned, or of any other state.

The progress of agriculture is apparent, first, from the increased number of persons devoted to this pursuit over the number so employed in 1860; secondly, from the rapidly increasing area and value of land in farms in this state; and thirdly, from statistics showing the actual production of successive decades.

The relative areas devoted to agriculture in the years 1850, 1860 and 1870, were as follows :

LAND in Farms, and the Value thereof.

YEAR.	Acres Improved.	Acres Unimproved.	Total in Farms.	Value.
1850	1, 045, 499	1, 931, 159	2, 977, 158	\$28, 528, 563
1860	3, 746, 167	4, 147, 420	7, 893, 587	131, 117, 164
1870	5, 795, 538	5, 815, 978	11, 611, 516	300, 415, 954

These figures show not only a rapid increase in the number of acres of wild lands converted into farms and brought under cultivation, but also a still more rapid increase in the value of such lands. For, while in 1850, the average value per acre was but \$8.58, in 1860 it had risen to \$16.61, and in 1870 to

\$26.73 per acre; the ratio of increase in value, during the past decade, being greater than the ratio of increase in quantity.

That our relative progress in the occupation and improvement of lands as compared with the progress of other states may appear, we have prepared the following tabular view of the like development of the four states adjoining Wisconsin :

LAND in Farms, and its Value—Michigan, Illinois, Iowa and Minnesota.

STATES.	Improved Lands.	Acres Improved.	Total.	Value.
Michigan, 1850.....	1,929,110	2,454,780	4,383,890	\$51,872,563
Michigan, 1860.....	3,476,296	3,554,638	7,030,834	160,836,495
Michigan, 1870.....	.....	.....	.....	.....
Illinois, 1850.....	5,039,545	6,997,867	12,037,412	96,133,290
Illinois, 1860.....	13,096,374	7,815,615	20,911,989	408,944,033
Illinois, 1870.....	.....	.....	.....	.....
Iowa, 1850.....	824,682	1,911,383	2,735,064	16,657,567
Iowa, 1860.....	3,792,792	6,277,115	10,069,907	119,899,547
Iowa, 1870.....	6,109,743	8,174,930	14,284,673	.....
Minnesota, 1850.....	5,035	23,846	28,881	161,948
Minnesota, 1860.....	556,250	2,155,718	2,611,968	27,505,922
Minnesota, 1870.....	2,314,488	4,118,850	6,433,338	97,621,691

In the character of the improvements made upon the lands credited to the several states as “improved,” it may be said that Wisconsin compares favorably with the foremost of the western states, and far excels some that are much older, and in some respects farther advanced. This is apparent from the statistics illustrating the relative rates of the increase in the value of the taxable real and personal estate in the several neighboring states :

States.	Per cent. of Increase.
Minnesota.....	163
Wisconsin	112
Missouri	105
Illinois.....	96
Michigan	79
Iowa.....	50

A still greater difference in favor of Wisconsin would be observed were we to compare her in these respects with the older states, most of which fall greatly below the lowest of the states above enumerated, and one of which (New Hampshire) falls as low as three per cent.

This is partly due, of course, to the peculiarity of Wisconsin lands, which are much more easily subdued than those of the less well drained and heavily timbered states, and yet which, in the vast pineries of the northern and unimproved portions, possess the means of building fences, barns and buildings at a less cost and of a more pleasing kind than is possible in most other districts of country.

Whatever the explanation, it is worthy of note that farm improvements in Wisconsin present a much more attractive appearance than those of Ohio, Indiana and many other states. The rule of making neat fences, good-looking and convenient barns, and tasteful farm-houses having once been adopted, there is a tendency to still further improvement.

The total valuations of taxable property in the state, including lands and all improvements, in 1860 and 1870, as assessed and equalized, were:

	1860.	1870.
Valuation as assessed.....	\$152,537,700	\$326,765,238
Valuation as equalized by state board.....	168,620,233	455,900,800

[For details of valuation see Appendix "A" at the end of volume.]

The working of the soil is probably neither more nor less thorough here than elsewhere—unless comparison be made with some of the best agricultural states east, where the half-exhausted condition of the soil has driven the farmer to deeper plowing, more frequent manuring and more careful cultivation of crops.

It is a source of gratification, however, that even upon our new and fertile lands, the opinion is gaining ground that thoroughness will pay better than that slackness of habit into which our first settlers fell. Drainage, the preservation and use of straw instead of burning it or leaving it to the slow process of decay in unsightly heaps, more thorough plowing, harrowing and rolling—these are the signs of better times.

There are some lessons, nevertheless, the importance of which, though oft-repeated through the medium of agricultural journals, and urged in the publications of this society, a

large proportion of the farmers of Wisconsin have, as yet, scarcely began to appreciate. They still turn their backs upon the important doctrine of rotation of crops, and are found, as they were ten years ago, growing wheat to the injury of their soil and the neglect of more remunerative methods of farming.

In condemnation of this ruinous, if not criminal, contempt of both science and common sense, we cannot forbear to add the important testimony of the Honorable Horace Capron, National Commissioner of Agriculture, as given to the country in an address delivered by him at the last Illinois State Fair:

“Your soil is wonderfully fertile. You may be disposed to consider it inexhaustible. It is an injurious if not a fatal error. The coffers of the most opulent treasury, constantly drawn upon, will eventually become empty. Statistics of production attest that repeated crops of wheat, on your best lands, show rapid deterioration; every crop taken from the soil, with no return, reduces the capacity of the farm for production in arithmetical ratio, and its capacity for profit in geometrical ratio. Such a course may give you, for a time, a little more ‘ready money,’ but you are certainly robbing your heirs; it is doubly difficult to renovate them; how difficult, you can only realize after trial. I have had a full experience of this in Maryland, having brought the value of a thousand acres, after years of labor and toil, from \$10 up to \$60 per acre, and repaid its cost. The difference between its original and improved yield in that period, which represents the measure of loss brought by former mismanagement, would have been a fortune in itself. I can point out farms in Maryland, thirty years ago reduced to barrenness and the meager value of \$2 per acre, through repeated cropping of corn and tobacco, which are now richly worth \$80, through the influence of clover, fertilizers, regular rotations, and judicious management generally. Then they could only yield a miserable support to their proprietors; now they maintain their owners in comfort and even luxury. It has been estimated that one hundred millions of acres of these worn-out lands have been thrown out of cultivation in the south. Beware of a similar experience in the west; *you are on the road to the same ruin*, which can only be averted by a prompt use of restorative agencies, and the exercise of an enlightened judgment in all the operations of your agriculture.”

The wheat crop of 1870 is estimated by the Agricultural Department to have been 13.4 bushels per acre, or very nearly two bushels less per acre than in 1869, when, according to the census returns, the total product was 25,323,647 bushels.

We are without the means of knowing the total yield, the state having collected no statistics and the census returns being for the crop of 1869. The diminished average yield per acre was probably made up, however, by the increased number of acres sown, and we may call the product, in round numbers, some 25,000,000 bushels.

Comparing the figures of the year 1869, as found in the census returns of 1870, with those of 1859, derived from the census returns of 1860, we have the following :

TABLE showing the number of bushels of Wheat grown in the several Counties of Wisconsin, during the years 1859 and 1869.

COUNTIES.	1859.	1869.
Adams.....	81,489	.....
Ashland	150	175
Bad Ax (now Vernon)	179,572	526,098
Barron	*	1,655
Bayfield.....	*	.....
Brown	21,475	156,783
Buffalo.....	76,267	565,625
Burnett.....	*	2,493
Calumet	97,024	332,107
Chippewa	14,154	81,092
Clark	3,826	8,159
Columbia	1,035,131	1,529,562
Crawford	35,121	182,420
Dane	1,754,182	2,730,130
Dodge	1,460,774	2,267,718
Douglas.....	170	10
Dunn	34,664	208,679
Eau Claire	45,278	208,241
Fond du Lac.....	1,233,614	1,610,362
Grant	773,542	897,635
Green.....	532,006	525,190
Green Lake.....	596,413	536,185
Iowa	398,569	767,875
Jackson	68,137	218,922
Jefferson	418,095	676,825
Juneau.....	72,275	194,048
Kewaunee.....	130,838	122,140
Kenosha	350,799	205,746
La Crosse	189,496	573,826
La Fayette	407,989	523,985
La Pointe	14	.....
Manitowoc	43,232	519,931
Marathon	4,220	36,027
Marquette.....	112,792	143,599
Milwaukee	118,307	238,630
Monroe	111,437	468,531

* Organized since 1859.

TABLE showing the number of bushels of Wheat grown, etc.—continued.

COUNTIES.	1859.	1869.
Oconto	1,202	23,992
Outagamie	87,473	353,187
Ozaukee	105,147	311,903
Pepin.....	16,741	97,905
Pierce	80,514	325,978
Polk	7,310	40,778
Portage	94,125	210,139
Racine	309,312	* 166,246
Richland	84,671	188,676
Rock	1,389,390	882,851
St. Croix	109,071	796,908
Sauk.....	361,028	487,001
Shawano	1,171	27,012
Sheboygan	270,055	570,665
Trempealeau	52,440	516,664
Walworth	807,165	611,809
Washington	362,311	714,094
Waukesha	582,012	646,244
Waupaca	96,889	192,745
Waushara.....	141,149	142,673
Winnebago.....	448,292	791,803
Wood.....	903	8,518
Totals	15,812,625	25,323,647

The above footings would indicate a very creditable progress in wheat growing during the past ten years. But it should not be forgotten that the crop of 1859 was a very poor one for that period, while that of 1869 was a pretty fair one for the present. The first half of this statement is substantiated by the fact that the crop of 1860, as shown by the returns of that year to the secretary of state, was no less than 27,316,306 bushels, or greater than that of any crop for several years past, if not the greatest ever produced by the state.

The ratio of production to population in 1859 and 1869, as shown by the United States census, exhibits scarcely any change: being as follows:

Bushels per inhabitant in 1859.....	23.82
Bushels per inhabitant in 1869.....	23.99

This is a very high figure compared with the per capita production in the older states, or indeed in any of the states, un-

* But partial returns.

less it be Minnesota, whose proportion is 40.13 bushels per inhabitant, by the returns of 1870.

If, on the other hand, it be borne in mind that since the year 1860 the number of acres annually sown to wheat has been very much greater than at that date, it will be apparent that the yield per acre has been proportionally less.

The crop in 1870 not only suffered somewhat in many localities from the drouth in the early part of the season, but also from the rainy weather during the period of harvest, and perhaps still more from the protracted and damaging rains while in the shock and stack. This last-named source of loss is one from which too many of our farmers suffer almost yearly. There is certainly no necessity in most cases for having grain exposed for weeks in the shock after it is sufficiently cured to put it into the stack or mow; nor can there be any good excuse for that slovenly manner of stacking which affords less than the most complete protection against the severest storms of rain that occur in this climate. As a general thing, however, the crop of last year was saved in pretty good order, as will appear from the report by the Chamber of Commerce:

GRADES of receipts of Wheat from the last six crops.

Crop of—	No. 1, PER CENT	No. 2. PER CENT	No. 3. PER CENT	Rejec'd PER C'T
1865	77.	15.6	.....	7.4
1866	10.8	50.7	28.8	9.7
1867	60.2	34.3	4.8	0.7
1868	37.3	57.7	3.9	1.1
1869	34.	56.	9.3	0.7
1870	42.7	49.4	7.8	0.1

We regret that we are without the figures to show the proportion of spring wheat to winter wheat. The change has been made from spring to winter in some localities within the past few years, and it is believed that, with early and proper seeding in the fall, so as to give time for a sufficient growth of the plant to protect itself during winter, winter wheat might be safely grown much more widely than at present.

The prices of wheat were discouragingly low early in the year 1870—touching as low as \$0.81 for No. 1, and \$0.73 for No. 2; but, later, prices advanced considerably, reaching the maximum in July, when No. 1 brought \$1.40 and No. 2 \$1.27 at Milwaukee.

The prices for each month in the year are shown in the following:

TABLE showing the range of prices of Spring Wheat during the year 1870.

MONTHS.	No. 1.		No. 2.	
January.....	\$0.81	@ \$0.89 $\frac{1}{2}$	\$0.75 $\frac{3}{4}$	@ \$0.84 $\frac{3}{4}$
February.....	84	@ 88 $\frac{1}{2}$	79 $\frac{1}{4}$	@ 84
March.....	84 $\frac{1}{2}$	@ 88 $\frac{1}{2}$	77 $\frac{1}{2}$	@ 82 $\frac{3}{4}$
April.....	80	@ 96 $\frac{1}{2}$	73	@ 94 $\frac{1}{2}$
May.....	90	@ 1.07 $\frac{3}{4}$	86 $\frac{1}{2}$	@ 1.04 $\frac{1}{2}$
June.....	1.01	@ 1.28	97	@ 1.25
July.....	1.12	@ 1.40	1.06 $\frac{1}{4}$	@ 1.35
August.....	1.08	@ 1.33 $\frac{1}{2}$	99	@ 1.27
September.....	98	@ 1.15 $\frac{1}{2}$	89	@ 1.13 $\frac{3}{4}$
October.....	1.00 $\frac{1}{4}$	@ 1.12 $\frac{1}{2}$	96 $\frac{3}{4}$	@ 1.10 $\frac{1}{2}$
November.....	93 $\frac{1}{2}$	@ 1.14 $\frac{1}{2}$	92 $\frac{3}{4}$	@ 1.12 $\frac{1}{2}$
December.....	1.04 $\frac{1}{2}$	@ 1.10 $\frac{1}{2}$	1.03	@ 1.08 $\frac{3}{4}$

The average price of No. 1 for the whole year being a fraction over \$1.02 and of No. 2, 97 1-2 cents, and the proportion of No. 1 to No. 2, being as 42.7 to 49.4, according to the report of the Chamber of Commerce above quoted, we have a general average of less than 99 cents per bushel for the wheat product of the whole state, provided the same had been delivered at Milwaukee. Deduct from this the cost of delivery at Milwaukee or any other market paying an equal price, and the price actually received by the farmers would probably fall below 90 cents. Multiply this by the average yield per acre, (13.4) and you have \$12.06, as the total value at the home market, of the product of one acre of land devoted to wheat.

With these data, the wheat maniac will be able, by a simple estimate of the cost of plowing, seeding, harvesting and hauling to market, to arrive at the net profits of the business.

It is flattering to our pride that Wisconsin should thus early have placed herself in the very front rank of the wheat grow-

ing states; \$22,790,128.20 is a handsome sum of money, by itself considered, and it makes a fine showing in the aggregates of the productive industries of the state; but we submit that it is not so large a sum to realize from the laborious cultivation and gradual impoverishment of over two and a half million acres of land as to awaken great enthusiasm in the breast of any sensible farmer.

We feel bound, therefore, to reiterate our oft-repeated protest against so absurd an agricultural policy, and urge again upon the farmers of Wisconsin that they should carefully consider the advantages of a more diversified system.

RYE.

Where wheat succeeds so well it is natural that rye should receive much less attention. It is a crop well adapted to light sandy soils in any of the northern states, but, owing to the superior value of its straw, will pay best in the neighborhood of large cities. New York, New Jersey and Pennsylvania produce nearly or quite as much as all the other states put together. In New England also, it is an important crop, although the aggregate product is not large.

The totals of the rye crop of Wisconsin in 1859 and 1869, as shown by the United States census returns of 1860 and 1870, were as follows:

	Bnshels.
1859	888,544
1869	1,356,736

This shows a very slight increase for a period of ten years. The crop of 1870 was a light one, as compared with that of 1860 when, according to the state census, it amounted to 1,659,998 bushels—probably the largest crop ever produced in the state.

The prices ranged between 68 and 90 cents per bushel; the average for the year being from 75 to 80 cents.

OATS

Made a poor yield in 1870, owing to the early drouth throughout the United States, and especially in Wisconsin. The defi-

ciency of yield per acre in Wisconsin is set down by the Agricultural Department at 23 per cent.; that of Iowa and Illinois being 20 per cent.

The aggregate crops of 1859 and 1869, as shown by the United States census returns of 1860 and 1870, were :

	Bushels.
Crop of 1859	11, 059, 260
Crop of 1869	20, 180, 016

The proportions of production to population in Wisconsin, Iowa and Minnesota in 1869 were :

Wisconsin, bushels per inhabitant	18. 83
Iowa .....do.....do.....(State census of 1869)	19. 08
Minnesota .....do.....do.....	23. 88

THE BARLEY CROP

Of 1870 was one of the best ever produced in Wisconsin. Still this is not a crop much grown by our farmers, and the rate per cent. of increase has been very small within the past ten years.

The crop of 1860 was 963,201 bushels; that of 1869, according to the late census, but 1,065,019 bushels.

The price in 1870 did not rule so high as in 1869, when the crop was generally much poorer.

PRICES of Barley at Milwaukee in 1867, 1868, 1869 and 1870.

MONTHS.	1867.	1868.	1869.	1870.
January.....	1.25@1.30	1.70@2.15	1.55@1.75	60@1.00
February.....	1.25@1.30	1.95@2.30	1.70@2.00	75@1.05
March	1.25@1.30	1.95@2.30	1.65@2.05	50@ 90
April	1.30@1.40	2.35@2.55	1.55@2.10	44@ 85
May	1.40@1.45	2.10@2.65	1.60@1.85	45@ 95
June.....	1.40	1.50@2.10	1.25@2.55	50@1.00
July .....	.....	1.28@1.50	1.10@1.55	45@1.07
August .....	.....	1.38@1.81	1.15@1.35	90@1.10
September	1.20@1.30	1.00@1.80	1.10@1.45	67@1.02
October	1.25@1.30	1.15@1.95	95@1.27	65@ 90
November.....	1.20@1.30	1.20@1.85	85@1.15	65@ 90
December	1.65@1.90	1.25@1.80	85@1.15	65@ 85

Barley requires a moist climate and an extended season to insure its success; and accordingly, it can hardly be expected to do so well, either in yield or quality, here as in the more favorable climate of England. Still, in view of the fair average we are able to get even in Wisconsin, the growing demand for it to use for malting purposes consequent upon the rapid increase of the beer-drinking population, and the high price it bears in proportion to the other cereals that require equal opportunities in the way of soil and cultivation, it is rather surprising that more of it is not grown.

In some of the states the increase of its production has been greater than of any other crop since 1860, but this appears not to be true of it in Wisconsin, notwithstanding the large foreign population, always accustomed to the use of malt liquors.

BUCKWHEAT

Is another crop that finds comparatively little favor in this state, although the actual increase of its production and the rate per cent of increase have greatly advanced since the date of the census of 1860.

	Bushels.
Product of the crop of 1859.....	38,987
Product of the crop of 1869.....	418,897
Rate per cent., of increase, 964.	<u><u> </u></u>

These figures are hardly a fair test of the increase in the production of this crop, for the reason that the crop of 1859 was an unusually short one—shorter, indeed, than that of ten years before, which was reported in the census as being 79,878 bushels.

The increase for the whole country during the years 1850 to 1860 was greater than that of any other grain crop, and the belief is that it has continued during the past ten years.

Having a very wide range of adaptations as to soil, though succeeding best on those which are moist and rich; coming later in its seed time than the other crops, so that it can even follow them the same season; being suited to seasons too wet for the successful growth of other crops, and hence to supply their deficiencies; being a rampant grower and a good cleanser

of foul lands by smothering out the weeds; and, finally, being a capital green-crop for plowing under as a manure, it is perhaps a ground of surprise that it has not met with more favor than it has outside of New York, Pennsylvania and Ohio, whose total crop of 1860 was full two-thirds that of the entire country.

INDIAN CORN

Is the great crop of America. In 1850, 1860 and 1870 its aggregates were more than twice as large as the total products of wheat, rye, barley, oats, buckwheat, peas and beans, in the United States.

	Bushels.
Corn crop of the United States in 1850	592, 071, 104
Corn crop of the United States in 1860	838, 792, 740
Corn crop of the United States in 1870	1, 100, 000, 000

For the production of this last great crop of one billion and one hundred millions of bushels, 39,000,000 acres of land were cultivated. A magnificent area, indeed! An area which, if brought into one enclosure, would constitute a corn field some millions of acres larger than the entire state of Wisconsin!

Being adapted to a great variety of soils and to almost every climate embraced within our vast domain; being easily cultivated, moreover, as well as free from those destructive attacks of disease and insect foes to which the cereals are nearly all liable, and furnishing a wholesome and palatable food for both man and beast, it seems destined to be always a favorite with the American farmer.

In early times, when the cultivation of corn required the use of the single plow and the hand-hoe, and the laborious service of many men to till an ordinary farm crop of it, the growing of fifty to one hundred acres was a good deal of an undertaking. But those were also the days of the sickle and the hand-cradle. They were also times of distant markets and impassable wagon-roads. In these better days of horse-planters and horse-hoes, as well as of railroads and home markets, the case is very different. Hence the rapid progress made in

bringing it into extensive cultivation in all portions of the country.

In Wisconsin, Indian Corn has gained even more ground than in many other states, though we can never hope to rival Illinois.

Corn crop.	Bushels.
Of 1859	7,517,300
Of 1869	15,037,998
Rate per cent. of increase, nearly 100.	<u> </u>

The crop of 1870, the exact statistics of which are wanting, was undoubtedly the best we have had in ten years, and certainly the largest, in the aggregate, the state has ever produced. It would not be surprising if a correct showing would give us nearly or quite 20,000,000 bushels, as the total yield.

The average yield per acre has been estimated by the Agricultural Department at 38 bushels. If this be correct—and we do not think the figures too high—Wisconsin stands among the very foremost of the states, in point of yield.

The opinion prevailed for a time that, with the exception of the southern tier of counties and the more favored counties further north, corn was not a safe crop in Wisconsin; or at least that none but the hardiest varieties could be relied on. Experience has shown that calculations based upon *latitude* merely were altogether erroneous—that, by reason of certain interesting and important peculiarities in the physical geography of our state, we are quite within the corn belt, and are able, with proper care, to produce good dent, and others of the more popular, though late-maturing, varieties so extensively grown in Illinois, Indiana and Ohio.

In the yield per acre, we can hardly compete with the rich corn lands of the Scioto, Miami and Mad river “bottoms,” where crops of 100 bushels and over are not uncommon; nor, indeed, can any other part of the world, of which we have knowledge.

Perhaps when our farmers have learned that corn is not injured by barnyard manure, and that deep plowing, and thorough cultivation, even up to a much later day in the season than is commonly practised, are sure means of increasing the

yield, instead of ranking second, Wisconsin may come to take the very first rank in the product per acre.

For the present, we are obliged to place Ohio at the head and let our reputation rest on the following very flattering figures:

Crop of 1870.	Bushels per Acre.
In Ohio	39
In Wisconsin.....	38
In Illinois.....	35.2
In Minnesota.....	33
In Iowa.....	<u>32</u>

The prices of corn at Milwaukee, during 1870, ranged between 45 cents and 87 cents per bushel; the average for the year being 64 cents.

In urging the profits of this crop upon the farmers of Wisconsin during the past twelve years, we have had in view, not only that it is in itself a less exhausting crop than many others, and yields a larger net profit in most cases, if properly cultivated, but also that its production encourages the raising of live stock, without which the fertility of any farm is sure to run down.

We confidently believe that the agriculture of our state would be still further improved by yet greater attention to corn-growing and its concomitants.

BEANS AND PEAS

Have never been very extensively grown in the western states. The crops for the United States at date of the last two census-takings, previous to 1870, were as follows:

Crop of	Bushels.
1850	9,219,901
1860	<u>15,061,995</u>

The product of seven of the western states in 1850 and 1860 was:

	1850.	1860.
Michigan	74,254	165,128
Illinois	82,814	108,028
Missouri	46,017	107,999
Ohio.....	60,168	102,511
Wisconsin	20,657	99,484
Indiana.....	35,773	79,902
Minnesota	<u>10,002</u>	<u>18,988</u>

The Wisconsin crop of 1869, as reported by the United States officers, was 388,425 bushels—an increase of over 290 per cent. since 1860.

These crops abound in nutritious matter, and besides being adapted to soils incapable of producing heavy crops of cereals and Indian corn, easy of cultivation, and favorable to clean tillage, if consumed largely upon the farm, may be made a means of keeping up the fertility of the soil.

Prices of white beans were considerably lower in 1870 than during the three years previous; the range being between \$1.00 and \$2.00 during the first quarter of the year, and between \$1.00 and \$1.50 per bushel for the remainder of the year.

White peas ranged between 85 and 95 for common, and between 90 and \$1.10 for choice.

POTATOES.

The potato crop of 1870 is estimated to have been 20 to 30 per cent. less than the average. This was partly due to an early drouth which extended over a wide belt of country reaching from Missouri across Illinois and eastern Wisconsin, and partly to the ravages of the *potato-bug* (*Doryphora decem-lineata*), which, in some sections effected the almost total destruction of the crop. Nevertheless the aggregates shown by the United States census returns of 1850, 1860 and 1870 are proof that this pest, with occasional touches of the rot, has not been able very materially to retard the progress of our agriculture in this particular:

	Bushels.
Potato crop of 1850.....	1,402,077
1860.....	3,818,309
1870.....	6,645,629

Thus far, nothing of acknowledge value has been devised in the way of a remedy. In some sections, Paris Green, mixed with flour and sprinkled upon the plant while the dew is on, has been tried and in others buckwheat—for which the bug is said, to have a strong aversion—is sown scatteringly by some

in the midst of the crop. Granting the certainty of these remedies, it must be admitted that the Paris Green is both rather expensive and disagreeable to use, and that the growth of buckwheat in one's potato-patch will of necessity interfere with easy cultivation and also tend to diminish the crop it is introduced to protect.

Believing neither of these methods feasible, a majority of our farmers seek to protect the crop by a frequent gathering of the beetles and killing them—a very *sure* remedy, one must admit, so far as applied, but rather laborious and difficult of application if one attempts to grow a heavy crop.

[See an illustrated article on “The Colorado Potato Bug,” in a subsequent portion of this volume.]

The prices of potatoes in the Milwaukee market for the several months of 1870, were as follows:

January.....	50@	65	July (old).....	60@\$1	37 (new.)
February.....	45@	60	August.....	80@	95
March.....	50@	65	September.....	80@\$1	10
April.....	40@	53	October.....	70@	90
May.....	35@	45	November.....	65@	90
June.....	60@\$1	00	December.....	70@	85

Sweet potatoes are grown very extensively in the southern states, but to a very limited extent in the north. The crop of the whole country has never yet (unless the last census should show such results) equaled two bushels per inhabitant; while the product of the southern states amounted, in 1860, to 4.16 bushels per capita.

The last three decennial crops in this state have been as follows:

Crop of	Bushels.
1850.....	879
1860.....	2,396
1870.....	2,220

The sweet potato delights in a rather sandy soil, and in a few localities thus characterized some of our farmers annually produce handsome crops.

TURNIPS, RUTA BAGAS, CARROTS, ETC.

It is a matter of regret that neither the state nor the United States' census supplies statistics of any of these crops—a fact which too plainly shows that they hold an unimportant place in the estimation of the agricultural public. Having repeatedly urged their importance to successful husbandry, not only as a means of ameliorating many soils, but also as being essential to stock-raising, without which permanently successful farming is impossible, we shall pass them without further remark in this place.

THE SUGAR BEET

Has not been so successful in Wisconsin during the past year as we had hoped. The several experiments made in its production, in Dane county, under the direction of Col. FARRINGTON of Madison, who, in the event of success, contemplated starting an extensive factory here, have shown that, in this locality, we cannot rely upon more than about eight per cent. of sugar. It is said to have succeeded better elsewhere. The results of experiments at Black Hawk, in Sauk county, are more encouraging, as will appear from the following quotation from a recent editorial in the *State Journal*:

“We gave an account last summer, of the organization of the ‘First Sauk County Beet Sugar Company,’ at Black Hawk, thirty-six miles west of here. We were agreeably surprised yesterday, by a visit from Senator B. U. STRONG of Spring Green, and Hon. C. C. KUNTZ, member of Assembly from Black Hawk, accompanied by a resident from their county, Mr. H. OCHSNER, treasurer of the above company, who had specimens of the beet sugar just manufactured there. From him we learn the following facts: The shares of the company were sold for \$250, on condition that the holder would raise and deliver to the factory four acres of sugar beets for each share held by him. The money obtained for the stock was used to put up a factory and buy machinery. In December last, a wooden building one hundred and nineteen feet long, forty feet wide and two stories high was completed. In addition to this there is a stone boiler room about twenty-four feet wide by thirty-six feet long; a wooden building called the bone-black house, about forty feet long and twenty feet wide; a tower about ten feet square and four stories high and two furnaces. The buildings are about ten rods from Honey Creek, and cost complete, seven thousand dollars.

"The machinery, part of which came from the sugar factories at Fond du Lac, Wisconsin, and Chatsworth, Illinois, and the rest from Chicago, New York and Philadelphia, cost, delivered at Black Hawk, nearly twenty-eight thousand dollars. The entire establishment being valued at \$35,000.

"About one hundred and eighty acres were planted to beets last spring. Owing to the drouth only one hundred and sixty acres were good. The average crop per acre was ten tons. The factory commenced operations one week ago. It employs two gangs of hands—about forty-four in all, who keep the machinery running day and night—twenty-two hours out of the twenty-four. About one ton of beets an hour can be manufactured there when everything goes well. The average product of the beets is twelve per cent. in sugar. We have been shown a specimen which is pronounced a good quality of B. sugar, as sweet, so far as we can discover, as the product of the cane, and worth 13 cents at wholesale in Chicago.

"The company has 1,500 tons of beets now, but owing to the fact that the beets will grow in the spring, and rapidly deteriorate in value, it is likely that there will not be sugar enough left in them after the last weeks in April, to pay for working. The war prevented the company from getting machinery in Germany, and therefore it was impossible to start the factory sooner than they did. The operations the last season have demonstrated that beets can be raised; that they contain a large percentage of sugar free from foreign substances. The material problems have been solved.

"The company has sent to Germany for four thousand pounds of seed, enough to sow five hundred acres to beets this season. It costs twenty-five cents a pound delivered here. They are going to put it all in, and commence sugar-making as soon as the beets are ripe next fall. The men who own the stock are shrewd, practical and earnest. They have gone to work right, and we believe they will show a bank account eventually which will set at rest all question concerning the profit to be gained by this sugar-making business in our state.

"The president of the company is John Schneller, secretary, John Wagner; treasurer, H. Ochsner; superintendent, William Wefferling. The three other directors are Adolph Sprecher, G. Baumgarth and M. Meider. There are thirty-four members in the company."

TOBACCO.

The true habitat of this plant is farther south; the climate of the Northern States being only adapted in general to the production of an inferior article, for smoking purposes.

Of the 434,209,461 pounds produced in the states and territories in 1860, only 23,814,248 were grown in the northern states. Virginia and Kentucky together produced more than half the tobacco grown in the United States.

The war, however, put a check upon the southern production, and so far advanced prices that northern cultivators were stimulated to extraordinary efforts; so that the product of this section has been multiplied many hundred fold.

The variety chiefly grown at the north is the Connecticut Seedleaf, which has a large tough leaf well suited to cigar making but unfit for chewing. The increase of production in Wisconsin since 1850, is shown below.

Crop of	Lbs.
1850.....	1,268
1860.....	87,340
1870.....	960,213

This increase of nearly one thousand per cent., since 1860, is so notable a fact that we have instituted more particular enquiries as to the localities where this growth of tobacco culture has been the most marked. So far as we have been able to learn, the larger proportion of the annual crop of the state is at present grown in Rock, Dane and Walworth counties; the largest buisness being done in the first named county, whose success is indicated by the following statement in the Milwaukee *Sentinel*:

“Last year the farmers of Rock county who reside in the vicinity of the village of Edgerton, raised and sold more than \$200,000 worth of tobacco, and this summer they have gone into its cultivation much more extensively than ever before. * * * * The average yield per acre is about 1,300 pounds; but the best fields produced 1,800 pounds, and netted the producers from \$100 to \$250 per acre. * * * * It is estimated that the crop this year (1871) which will be marketed in Edgerton will be worth from \$300,000 to \$400,000. In other sections of the state, we hear of many farmers who are engaged in its cultivation, but to what extent we are unable to say. In regard to the quality of the Wisconsin weed, we may state that at the fair held at Cincinnati last season, some specimens sent from Rock county were considered superior to any Kentucky grown article on exhibition.”

Tobacco is so hard a crop on the soil, and we feel so little inclination, on general principles, to encourage its cultivation that we may have done less than justice to its profitableness as a crop in Wisconsin.

HOPS

Fall in nearly the same category. Nevertheless, this crop has enjoyed an unparalleled popularity in Wisconsin, of late years, and made a larger advance, in the amount produced since 1860, than any other crop whatever, as witness these figures :

Crop of	Pounds.
1859	135,587
1869	<u>4,630,155</u>

It is proper to remark, however, that the ravages of the hop-louse in 1868 put so decided a check upon the enthusiasm of our farmers that the product has been considerably less since that date than before. Nor is the old enthusiasm likely to recover from that shock under the depressing influence of prices, such as ruled at the Milwaukee market during the year 1870, viz., 10 to 12½ cents for the old crop (1869), and 10 to 15 cents for the new. Up to September (see *Report of Chamber of Commerce*) considerable quantities from the crop of 1868 were on the market and generally sold at 2½ to 3½ cents per pound.

As in England, so in the United States, the permanently successful production of hops has hitherto been confined to a small area. Up to 1860 full four-fifths of the whole crop of the country had been grown in six counties of New York, namely, Otsego, Madison, Schoharie, Oneida, Herkimer and Montgomery. Next to New York, Wisconsin, then Vermont.

FLAX.

Previous to 1850 this crop had received considerable attention in this country. But owing to the immensely increased production of cotton and the low price of all cotton goods, the culture of flax went backward during the succeeding decade, as will appear by these figures :

	Pounds.
Flax crop of the United States, census of 1850.....	7,709,676
Flax crop of the United States, census of 1860.....	<u>4,720,145</u>

In some of the states the decline was much greater than this.

Flax Crop of	1850.	1860.
Connecticut	17, 920	1, 187
Maine	17, 081	2, 997
New Hampshire.....	7, 652	1, 347
Indiana	584, 469	97, 119
Illinois	160, 063	48, 235
Missouri	627, 160	109, 837
Kentucky	2, 100, 116	728, 234

While, on the other hand, but two states and one territory showed an increase, namely:

Crop of	1850.	1860.
New York	740, 577	1, 518, 025
Ohio.....	446, 932	882, 423
Utah	550	4, 343

But again the scale turned after 1860, when the coming of the war of the rebellion put a check upon the production of cotton, and so increased the price of what little could be obtained, that the whole world went in quest of substitutes.

We are at the date of this writing without the census tables of 1870 for the country as a whole, and are, therefore, without the data for a demonstration of the increased production between 1860 and 1870, which we feel sure was made in all the northern states.

Crop of	Pounds.
Wisconsin in 1850	68, 393
Wisconsin in 1860	21, 644
Wisconsin, census of 1870.....	497, 398

The difficulty hitherto has been in the great difference in the price of labor in the flax-producing countries of the old world and in America—a difficulty that can only be effectually overcome by the introduction of improved machinery and processes for the manufacture of linen fabrics. Great improvements in these particulars have been made already, but much more yet remains to be done.

Some years since, while the prices of certain fabrics were so very high, the attention of machinists and chemists was strongly turned to the discovery of means by which the linen

fibre could be as easily worked on the improved cotton machinery of the present as cotton itself—to the practicability, in short, of *cottonizing* flax.

Perhaps the first organized movement in this direction was made by the Rhode Island Society for the Encouragement of Domestic Industry, which in 1861 offered large rewards for the stimulation of such investigations.

This was followed at the succeeding session of the New York legislature by the appropriation of \$2,000, to be expended, under the direction of the State Agricultural Society, for the encouragement of those who were seeking by machinery to test the practicability of manufacturing flax-cotton. In pursuance of this action, the society issued a circular inviting all who had been successful in “the preparation of flax, as an economical substitute for cotton, so as to be used on cotton machinery,” to present their claims to a committee of the society thereafter to be appointed.

The committee, consisting of Messrs. Samuel Campbell, John Stanton Gould and Alfred Wild, after a careful inquiry into the claims made by competitors, were unable to recommend the award of the premium, but nevertheless gave an encouraging account of the progress made.

From a report made by Geo. E. Dyer and Mr. Albert Briggs of Rhode Island, who attended the New York society's committee in their investigations, we quote the following concise statement of the several steps in the process then used in the factory of the Lockport Flax-Cotton Company.

1. Breaking, by passing through revolving fluted rollers.
2. Dusting, by passing through a machine similar to the willow of the cotton manufacturer.
3. Scutching.
4. Combing, by a process like that for preparing worsted yarn.
5. Dusting again.
6. Steeping the fibre 24 hours in tepid water.
7. Boiling in soap and soda ash (3 pounds of the latter per 100 pounds of fibre) for 12 hours.
8. Immersing in chlorine for 2 hours or more, as necessary for bleaching.

9. Immersing in sulphuric acid for 2 hours, (of one degree of strength.)
10. Dipping in a solution of alum, borax and salt.
11. Washing in distilled water with a little sal soda.
12. Drying by heat from steam pipes.
13. Passing the fibre through a "lapper."
14. Carding on machines similar to wool cards.
15. Passing through a vent way heated with rotary gills.
16. Passing through a drawing frame.

The loss in passing through the breaker was estimated at 30 per cent.; through the duster, 30 per cent. more; in scutching, 5 per cent. The entire loss from straw to cottonized flax, 75 per cent.

The cost of straw was estimated at \$10 per ton, green; rolled \$12 to \$15 per ton; cost of labor 3 1-3 cents per pound; cost of rolled flax, 3 cents. Total cost 6 1-3 cents per pound.

It is probable that subsequent improvements in the process of *cottonization* have added yet further to the economy of the production.

The difficulties not yet perfectly overcome are to make a perfect separation of the linen fibre from the *shives* or broken fragments of the woody portion of the straw, and to find a satisfactory solvent for the cement which binds together the ultimate fibres of flax proper.

In 1863 Congress, impressed with the importance of extraordinary efforts to improve the manufacture of flax, appropriated \$20,000 to be used under the direction of the Department of Agriculture in such manner as should seem best calculated to promote that object.

In fulfillment of the obligation thus imposed upon the Department, the Commissioner of Agriculture appointed Hon. J. K. Morehead, of Pittsburg, Hon. Charles Jackson, of Providence, and Dr. John A. Warder, of Cincinnati, a commission to carry out the provisions of the act.

The general result obtained by this appropriation is thus stated in the Commissioner's Report for 1866:

"Since my last report, I have returned to Congress the trust confided to my care, relative to improvements in processes for preparing flax fibres for manufacture, and to the treasury of the United States the sum of \$10,500,

the unexpended balance of the appropriation for that purpose. While complete success in cottonizing flax was not obtained, practical results of great economic value have been accomplished, and improved fabrics have been placed in the market by manufacturers who have been most successful in their experiments, and who are still continuing their efforts in that direction."

Under the stimulus of these several organized efforts, effectually sustained during the war by the high prices of cotton goods and the high premium on gold, the production has greatly increased; some producers, since the decline of gold and cotton, growing the crop for both fibre and seed, and others for the seed alone.

According to the statistician of the Agricultural Department, [See Report of 1869, p. 58,] the proportion of flax-fibre wasted throughout the country is no less than three-fourths—a fact which, taken in connection with the annual importation of something like \$23,000,000 worth of fibre from foreign countries, is further proof of how much depends on the improvement of our processes of manufacture.

But with an indifferent demand for the fibre—and this demand could be largely increased by the establishment of simple dressing mills in every section specially adapted to the crop—and even at present moderate prices for the fibre and seed, any farmer who understands the necessities of the crop, and has a suitable soil, can make a crop of flax pay better than wheat, as a rule. Indeed, it is claimed by some farmers in the west, who have grown it for years, that it pays better than wheat, if grown for seed alone.

It possesses the advantage of being adapted to any deep, strong, heavy upland soil if naturally well drained, (the New Yorkers say, to any soil that will grow good barley,) and of working in with other crops so that a double product may, with proper regard to manuring, be obtained from a given piece of land in a single season. And if the refuse of both straw and seed be converted into manure, as it should be, so far from being an exhausting crop, as is sometimes claimed, it is really much less so than wheat.

The product per acre in the west is from 1 to 3 tons of the straw, and 8 to 20 bushels of the seed, according to soil, seed-ing and cultivation.

The average price of the seed in Milwaukee and Chicago the past year was about \$1.80 per bushel.

GRASS AND GRASS SEEDS.

It is an occasion for much regret and serious comment that Wisconsin farmers have not yet come to a proper realization of the importance of a more general and thorough cultivation of the grasses. The following figures will tell the story of our slow progress in this particular during the past ten years:

	1860.	1870.
Hay crop of Wisconsin, tons.....	855,037	1,287,651
Grass seed, bushels.....	26,512	13,016
Clover seed,....do.....	3,852	2,906

Making due allowance for the large proportion of the hay crop that should be classed as *marsh* hay, and that circumstances may account for a relative proportionate increase of this kind, we are not far from the mark in assuming that there is but little if any more *cultivation* of the grasses now than there was ten years ago!—which, to any thorough-going, systematic farmer in the world will be abundant proof that our agriculture is still of that rude, blundering, make-shift sort which would more properly characterize a semi-barbarous people.

These humiliating statistics are confirmed as being approximately correct by any one who has of late traveled extensively over the state, and noted the scarcity of the fields of clover—that most nutritious food for domestic animals, and most admirable renovator of exhausted soils.

As a cleanser, mellow, and enricher of the soil, there is no substitute for it among all the crops or other agencies known to agriculture.

Complaints are sometimes heard among our farmers that clover “heaves,” “winter kills,” “will not grow.” Have such

farmers given it a fair trial? Sowing it upon tenacious clayey loams, in which it delights, have they been particular about the preparation of the soil, and the sowing with grain that will protect it while tender from sun and frost? or sowing upon soils half sterile, have they begun their attempts by first plowing under a crop of rye or buckwheat, and resorted to "plastering" and such other means as the best authorities prescribe.

There *is a way* to succeed with clover upon almost any of our lands, and they who find it difficult should seek earnestly for a remedy.

The profitableness of grass-seed growing with those who succeed may be judged from the following:

TABLE showing range of prices of Grass Seeds, at Milwaukee in 1870.

MONTHS.	Timothy, per bush.	Clover, per bush.
January.....	\$3.00@ \$4.00	\$8.00@ \$9.00
February.....	3.50@ 4.25	8.50@ 9.50
March.....	3.75@ 5.50	8.50@ 9.75
April.....	5.25@ 6.75	8.50@ 11.50
May.....	5.00@ 6.75	10.00@ 11.50
June.....	5.00@ 6.00	10.00@ 11.50
July.....	5.00@ 7.00	10.00@ 10.50
August.....	4.00@ 4.50	10.50@ 11.00
September.....	3.75@ 5.25	6.00@ 11.50
October.....	3.50@ 4.50	5.00@ 7.00
November.....	3.50@ 5.50	4.75@ 6.00
December.....	4.00@ 4.72	5.00@ 6.00

SUGAR AND MOLASSES.

In the production of maple sugar and molasses there has been a material falling off since 1860; while in the production of sorghum sirups there has been as marked an increase, as shown by the late census, notwithstanding the discouragements consequent on the free importation of foreign sugars.

	1860.	1870.
Maple sugar, lbs.....	1,584,451	507,102
Maple molasses, gallons.....	83,118	31,218
Sorghum molasses.....	19,854	74,478

FRUIT CULTURE.

Has made rapid strides in Wisconsin within the past ten years. This is patent enough to everybody familiar with our industrial development. The figures of the census only confirm what has been to lovers of fruit a ground of rejoicing since the fatal winters of long ago, and the hey day of the coccus, now pretty well "done for."

How much of this success in the protracted contest with climate, insects, and, worse than all else, the ignorance of the public, is justly attributable to the fostering care, stimulation and encouragement afforded by this society and the State Horticultural Society will never be known. But is it not much to have contributed anything to so important a result? Who can estimate the importance to our present population and to the multitudes yet to inhabit this State, of the certain information that, among apples, the Red Astrachan, Duchess of Oldenburg, Fameuse, Talman Sweet, Golden Russet and Westfield Seek-no-further may be planted with confidence in all portions of our state, and that the planting of a large proportion of the many varieties with which experiments were made during the first twenty or more years of our industrial history is equally sure to lead to disappointment and loss, earlier or later? Who can estimate the saving of money, patience and comfort that will be made by knowing that the Delaware and Concord Grapes; the Imperial Gage, Blucher's Gage, Duane's Purple Gage, and the Lombard Plums, the Doolittle and Purple Cane raspberries, and most varieties of currants, gooseberries and strawberries, are worthy of our confidence, while the attempt to produce peaches, most varieties of cherries other than the Early May and large English Morello, and of pears other than the Flemish Beauty, is pretty sure to result in failure?

To the untiring and resolute nurserymen and careful amateur cultivators and farmers, by means of whose intelligent and oft-repeated experiments so much has been accomplished, the state of Wisconsin and the population of the entire northwest owe a

debt of gratitude which it is hardly probable that they will ever realize.

Whatever the causes, it is a most gratifying fact that Wisconsin is rapidly taking rank among the first fruit-growing States.

The following statistical statement, derived from the census returns of 1850, 1860 and 1870, will show the ratio of progress made in this direction:

Value of orchard products in 1850.....	\$4,823
Value of orchard products in 1860.....	78,690
Value of orchard products in 1865, (state census).....	386,363
Value of orchard products in 1870.....	819,268

The horticultural interest is one that appeals directly to every citizen, and which, owing to the peculiar difficulties that attend its advancement should be liberally fostered by the state.

DOMESTIC ANIMALS.

The rearing of domestic animals, whether for the shambles, for the products they annually yield, or for farm work, is one of the most agreeable, as it is also one of the most profitable departments of husbandry.

To the western farmer it is profitable in three important ways:

First, if the farm upon which such animals are to be raised should be contiguous to any of those extensive areas of lands unoccupied by settlers, and yet abounding in rich pasturage for the farmer's flocks and herds, which in all the newer regions are interspersed among the improved farms, the stock-grower will be able to realize large returns with but little expenditure of money.

Secondly, if this should not be the case, and the farmer should have to rely exclusively upon the products of his own farm, still he will be the gainer by condensing such bulky materials as hay, corn-fodder, corn, ruta bagas and carrots, at a long distance from the best markets, into the more compact and portable forms of beef, pork, butter, cheese and wool.

Thirdly, by saving all the refuse of the materials so condensed, and properly returning them to his lands, he will be enabled to keep up the fertility of his farm.

These are advantages that cannot be gainsayed, and the farmer who most regards them will be best rewarded.

In this state, there is another very important and peculiar advantage, namely, the almost entire immunity, so far, from those destructive diseases which in so many of the other states have at times made stock-raising not only hazardous to all, but ruinous to many who have been largely engaged in it. Our farmers have been almost total strangers as well to the pleuropneumonia and foot-ail of New England, the murrains of the middle states, the choleras of the states of Illinois and Iowa, and the infections of the southwest. This important fact cannot be accidental, but is evidently due to the exceptional healthfulness of the Wisconsin climate, and to the freedom of our flocks and herds from those exposures to which those of other states are liable.

As announced in previous reports of recent years, there is evident in Wisconsin a growing appreciation of stock-raising as an essential element of good farming. It shows itself not so much perhaps in the increased number of domestic animals raised as in the constantly improving qualities of them.

TABLE showing the the number of Domestic Animals in Wisconsin in the years 1850, 1860 and 1870, with the total value thereof.

Animals.	1850.	1860.	1870.
Horses	30,179	116,180	252,019
Asses and Mules.....	156	1,030	4,135
Milch Cows.....	64,339	203,001	308,377
Working Oxen	42,801	93,652	52,615
Other cattle.....	76,293	225,207	331,301
Sheep	124,896	332,954	1,069,282
Swine	159,276	334,055	512,777
Whole No. of animals	497,940	1,306,080	2,530,506
Value of all live stock. .	\$4,897,385	\$17,807,375	\$45,310,882

From the foregoing figures, it will appear that, while the total number of domestic animals in 1870 exceeded the total number in 1860 by a fraction over 93 per cent., the value of them has increased in the ratio of over 154 per cent. Looking at the figures more narrowly, we observe the rate per cent. of increase in numbers was much the greatest in the case of sheep, to-wit. : over 300 per cent., and since the sheep is an animal which represents the lowest amount of any in market value, it will be manifest that the rate per cent. of increase in the value of stock, other than sheep, has been considerably greater than 154 per cent. Perhaps it would not be far from the mark to say of the horses and cattle of the state, that while they have increased in numbers at the rate of 48 per cent., their increase in value has been over 160 per cent.

Of course it is impossible to say how much of this increase in value is due to the circumstances which have affected the value of all classes of property in the United States during the past ten years, and how much to the efforts made by so many of our farmers to improve their stock by the infusion of better blood, and by proper attention in general to the established principles of breeding and rearing. But we are led by what we know personally of the agencies last named to adopt the conclusion that they have exerted a large influence upon the general result.

HORSES.

• Our horses have been very much improved in value by the importation of many thoroughbred, as well as other, stallions calculated to improve the quality of our road horses and horses for general purposes. Quite recently there has been an importation from Europe of several very valuable stallions of the "Percheron" breed, which must exert a marked influence upon the breeding of stock for heavy draught.

Under the impetus thus given to the business of breeding, there is warrant for believing that Wisconsin will, at an early day, range among the foremost states distinguished for producing fine horses and a great many of them.

It may be well enough for our farmers and stock-breeders who will take courage from the foregoing figures to know, however, that a neighboring state, which was once a part of the "territory of Wisconsin"—which came into the Union of states but two years in advance of us—the area of whose cultivated lands is but a trifle greater than that of the improved lands of Wisconsin—and whose population is a little less—has outstripped us in the live-stock department of husbandry and is still advancing at a quicker pace than ours.

TABLE showing the number of *Horses in Wisconsin and Iowa.*

Number of Horses.	Wisconsin.	Iowa.
In 1850.....	30,179	38,536
In 1860.....	116,180	175,088
In 1870.....	252,019	482,786

Iowa has likewise beaten us in the raising of asses and mules, as will appear by the following:

TABLE showing the number of *Asses and Mules in Wisconsin and Iowa.*

Number of Asses and Mules.	Wisconsin.	Iowa.
In 1850.....	156	754
In 1860.....	1,030	5,734
In 1870.....	4,135	28,420

NEAT CATTLE.

The increase in the number of neat cattle, it will be observed, has not been so marked. Indeed it has only been 51 per cent., as against over 100 per cent. for horses.

Herein also we are led by Iowa, the number of whose cattle and the rate per cent of increase are very much greater than ours, as seen below :

TABLE showing the number of Cattle of all ages in Wisconsin and Iowa.

Number of Cattle of all ages.	Wisconsin.	Iowa.
In 1850.....	83,433	136,621
In 1860.....	521,860	540,088
In 1870.....	692,293	*2,108,667

For the raising of cattle Iowa has this advantage over Wisconsin—the small aggregate area of her timbered lands and correspondingly greater extent of prairie ranges for stock. But the difference between 692,293 and 2,108,667 seems too large to be accounted for in this way. Let us see if there be not some further reason discoverable.

The prices of beef and beef product in the Chicago market (statistics of Milwaukee prices not at hand) appear below :

PRICES of Live Cattle and Beef Product at Chicago during 1870.

MONTHS.	Cattle per cwt.	Extra Mess Beef.	Mess Beef	Tallow.
January.....	\$2, 75 @ \$7, 70	\$13, 00 @ \$14, 00	\$11, 00 @ \$12, 50	8 $\frac{3}{4}$ @ 9 $\frac{1}{2}$
February.....	3, 37 $\frac{1}{2}$ @ 8, 00	13, 50 @ 14, 00	11, 50 @ 12, 50	8 $\frac{1}{2}$ @ 9 $\frac{1}{2}$
March	4, 00 @ 8, 00	13, 50 @ 15, 00	12, 00 @ 13, 50	8 $\frac{1}{2}$ @ 9 $\frac{1}{2}$
April	4, 75 @ 8, 50	14, 00 @ 15, 50	13, 00 @ 13, 50	8 $\frac{1}{4}$ @ 9 $\frac{1}{2}$
May	4, 75 @ 8, 85	14, 50 @ 16, 00	13, 00 @ 14, 00	8 $\frac{1}{4}$ @ 9 $\frac{1}{2}$
June.....	3, 50 @ 9, 00	15, 00 @ 16, 00	12, 00 @ 14, 00	8 $\frac{3}{4}$ @ 9 $\frac{1}{2}$
July	3, 25 @ 9, 50	15, 00 @ 16, 50	12, 00 @ 14, 50	8 $\frac{3}{4}$ @ 9 $\frac{1}{2}$
August	3, 00 @ 8, 75	.....	.....	9 @ 10 $\frac{1}{4}$
September	3, 00 @ 8, 00	13, 50 @ 14, 00	11, 50 @ 12, 00	9 @ 9 $\frac{3}{4}$
October	2, 75 @ 7, 50	13, 50 @ 14, 00	11, 00 @ 12, 00	8 $\frac{1}{2}$ @ 9 $\frac{1}{2}$
November.....	2, 50 @ 7, 75	13, 00 @ 13, 50	10, 50 @ 11, 50	8 @ 9 $\frac{1}{4}$
December	2, 75 @ 8, 00	12, 50 @ 13, 00	10, 00 @ 11, 00	7 $\frac{3}{4}$ @ 8 $\frac{1}{2}$

DAIRY PRODUCTS.

In the number of milch cows we come nearer maintaining an equality with Iowa. Indeed we have gained a very respectable standing. Witness the figures :

*State census of 1869.

TABLE showing the number of *Milch Cows* in *Wisconsin* and *Iowa*.

Milch Cows.	Wisconsin.	Iowa.
In 1850.....	64, 339	45, 704
In 1860.....	203, 001	189, 802
In 1870.....	308, 377	*367, 602

In the amount of dairy products we have fairly beaten our neighbor. For although her milch cows outnumber those of Wisconsin by 59,425, the quantities of butter and cheese produced by Wisconsin are slightly in excess of those of Iowa—a fact which would seem to speak well for either the character of our stock, the quality of our feed, the superior care of our farmers, or the better management of our cheese and butter manufacturers. But it occurs to us that there must be some important relation between this increase of our dairy products over those of Iowa, and her extraordinary increase of cattle over ours, as noted on a previous page. Is it not probable that Iowa farmers, caring more to increase their stock than to turn the milk of their cows into butter and cheese, allow a much larger per cent. of their calves to run with their dams for a season than do the farmers of Wisconsin? We have suspected this to be the secret of the differences in question, and the results of inquiring confirm the suspicion.

It seems that our farmers being within range of the cheese factories are so anxious to turn their milk into money that they are in the habit of killing off their calves at a day old, or at the latest as early as their hides will be saleable. This naturally diminishes the supply of cattle and calves for the butchers and raises the price of meat in the local market; and this demand in turn results in the slaughter of large numbers of young cattle of all ages.

* State census of 1869.

TABLE showing amounts of *Butter and Cheese made in Wisconsin and Iowa during the years 1850, 1860 and 1870.*

Number Pounds of Butter and Cheese.	Wisconsin.	Iowa.
Butter made in 1850	3,639,750	2,171,188
Butter made in 1860.....	13,611,322	11,953,666
Butter made in 1870.....	22,473,036	*22,065,724
Cheese made in 1850.....	400,283	200,840
Cheese made in 1860.....	1,104,400	918,635
Cheese made in 1870.....	1,592,798	*1,188,546

It is worthy of notice, that while the production of *butter* has nearly doubled, since 1860, there has been but a very small increase in the amount of cheese manufactured. Doubtless, the great number of cheese factories, springing up in all parts of Wisconsin will result in a large proportionate increase of this product; but thus far they seem merely to have manufactured about the same amount that would otherwise have been made on the farm.

[For list of cheese factories already in operation in this state, look under the head of manufactures.]

No intelligent farmer any longer questions the possibility of greatly increasing the milk-producing qualities of cows by breeding with reference to it; and yet, so far as we have observed, but comparatively little attention has been given to this matter. The Ayrshires are universally acknowledged to be the best milkers—at least if we regard *quantity*, and they also yield a good quality of milk—and yet we know of but two or three small herds in the whole state. If there are insurmountable objections to the introduction of this breed, we have yet to learn what they are.

As the prices of butter necessarily vary somewhat with the character of the season, we give the monthly averages for the whole period since 1860:

*State census of 1869.

TABLE Showing prices of Butter in Milwaukee for the past ten years.

MONTHS.	1870.	1869.	1868.	1867.	1866.	1865.	1864.	1863.	1862.	1861.
January	18@26	25@35	15@28	10@23	20@25	25@38	17@22	12@14	6@ 8	8@10
February	15@26	24@34	18@23	10@22	20@24	23@32	18@25	12@15	7@ 8	8@10
March	15@30	25@38	20@40	10@23	21@35	17@26	20@30	15@20	8@ 9	8@ 9
April	17@33	24@38	25@45	10@24	20@35	12@24	18@40	12@20	8@ 9	8@ 9
May	15@25	19@29	15@38	10@23	20@27	12@30	18@23	10@15	7@ 9	7@ 9
June	13@22	18@25	15@24	10@16	20@25	10@20	18@28	11@14	7@ 8	7@ 8
July	12@22	18@26	18@26	10@18	18@25	10@21	25@33	10@15	8@ 9	6@ 8
August	15@23	20@28	20@30	10@20	18@25	15@23	32@41	12@15	7@10	6@ 8
September	15@25	20@28	25@39	15@25	20@25	18@33	30@40	18@20	8@11	6@ 8
October	16@28	20@32	27@40	15@35	18@26	23@38	25@35	15@22	9@15	6@ 7
November	15@26	19@30	25@35	15@32	18@28	24@37	32@37	18@22	12@16	5@ 8
December	11@25	18@25	22@35	15@32	12@25	20@28	32@40	16@20	12@15	6@ 8

Great efforts have been made of late years to improve the old methods of making butter and cheese, and with most excellent results. Foremost among those most prominent in this good work has been, and still is, Mr. X. A. Willard, A. M., of New York, who by his carefully conducted experiments, his valuable editorial articles in the *Rural New Yorker*, his contributions to foreign journals, his lectures in the Maine State Agricultural College, and his numerous addresses, delivered in all parts of the country, has done a highly important work. In view of which we deem ourselves fortunate in having secured for publication herewith a revised and enlarged edition of his recent contribution to the *Journal* of the Royal Agricultural Society of England, on "American Butter-Making"—a paper which has been received with great favor abroad, and which will be read with still greater interest by the dairymen and farmers of this country.

SHEEP.

Sheep husbandry is still under a cloud, for the reason given in our last report. A few of the more resolute, thrifty and persistent of farmers go ahead as though nothing had happened, and are doing well; but the majority have not yet fully recovered from their disgust at the fall of prices after the war.

The number of sheep in 1870 was 1,069,282, more than three times as many as the state numbered in 1860, and yet so far below the number (2,370,106) reported by Iowa, that we feel no inclination to boast of it.

The rate of increase in the number of our sheep will appear by the following statistics:

Number sheep in 1850	124, 896
Number sheep in 1860	332, 954
Number sheep in 1870	1, 069, 282

If the quality of the sheep of Wisconsin be considered, it is believed that the comparison will be less to our disadvantage. A large number of our breeders have devoted themselves to the importation of the very best sheep that could be

purchased, and their flocks will compare favorably with any in the west.

The amount of wool credited to Wisconsin by the late census is proof that these statements are well founded. For the sake of illustrating the ratio of progress in wool-growing, and the proportion of wool to the whole number of sheep reported, we give a comparative view of the returns of 1850, 1860 and 1870.

TABLE showing amount of Wool produced in Wisconsin and Iowa for 1850, 1860 and 1870.

Wool produced.	Wisconsin.	Iowa.
In 1850	253, 963	373, 898
In 1860	1, 011, 933	660, 858
In 1870	4, 090, 670	*4, 478, 934

It thus appears that over two millions of Iowa sheep, in 1868, yielded some four and a half millions of pounds of wool; while, in 1869, a million of Wisconsin sheep sheared four millions of pounds. A difference of one and a half pounds per head is so considerable that one only lacks a guaranty of the correctness of the figures to warrant him in drawing conclusions highly favorable to the wool-producing qualities of the sheep of this state.

The prices of wool at Milwaukee during the season of 1870, as given in report of chamber of commerce, were as follows:

PRICES of Wool at Milwaukee during the season of 1870.

Dates.	Common to extra, tub washed.	Medium to Fine Fleece.	Coarse Fleece.	Common to extra Pulled.
June	38@42	34@37	30@36	31@33
July	38@43	36@41	30@38	31@33
August	40@45	38@42	37@40	31@32
September	40@45	38@41	37@38	31@32
October	40@45	38@40	37@41	31@33

Wool-growing is a permanent interest in Wisconsin. Nature has decreed it, and when our farmers learn to wisely adapt

* State census of 1869.

themselves, in its management, to the laws of supply and demand, it will permanently rank among the most profitable branches of our husbandry. It is profitable even now; but except as a result of war or other national upheavals, it ought not to be subject to those frequent ups-and-downs which have characterized the past. It will not, when reason and judgment rule instead of fever and fashion.

We may not be able in the United States to compete with the herdsmen of South America in the production of the coarsest wools, but with our boundless areas of rich natural pasturage, our admirable climate and numerous other advantages, we ought to be able to compete with any portion of the world in the production of the better classes of wool.

We have not the figures at hand to show just what proportion of the 49,812,392 pounds of wool imported in 1869 was of the finer grades, but it is safe to say that a considerable amount of the millions of money sent out of the country for such imports ought, by some means, to have been kept at home; as also the larger part, if not the whole, of the \$42,225,482 paid to foreign manufacturers for woolen goods.

SWINE.

In this department of stock-raising, we have been even more backward than in the preceding, as will appear from the following statistics:

TABLE showing the number of Swine of all ages in Wisconsin and Iowa in 1850, 1860, 1870.

Number of Swine of all ages.	In Wisconsin.	In Iowa.
1850	159,276	323,247
1860	334,055	934,820
1870	512,778	2,409,679

From the fact that hog-raising and corn-growing naturally advance together, the above results might have been anticipated, on the basis of what we have seen of the small increase

in the amount of Indian corn produced in 1869 over the amount in 1859.

It is an encouraging fact, however, that more attention has of late been directed to the improvement of our breeds of swine by numerous importations from other states and even from foreign countries. If they do not raise so large a number, our farmers, many of them, are at least determined to ascertain what breeds are most economical.

It is believed that the production of pork is an interest that may well engage the attention of the farming public to a much greater degree than at present. Pork, like wheat, always finds a market at some price, and besides its relative compactness, which is of itself a great point where the producer is far from the controlling markets, possesses this further advantage, namely, that by requiring the consumption of the pork-producing crops upon the farm, instead of selling them for exportation, so much as becomes refuse or offal in the process of feeding is thereby saved to the soil.

The prices paid for hogs during the past few years are further confirmation of what we have said of the profits of the pork business.

TABLE showing the season prices per 100 lbs. of Dressed Hogs, since 1860.

Seasons.	November.	December.	January.	February.	March.
1860-61	\$5.00@ \$6.55	\$5.00@ \$5.75	\$5.40@ \$6.50	\$5.90@ \$6.50	.....
1861-62	2.00@ 3.50	3.00@ 3.50	2.50@ 3.00	2.65@ 3.90	.....
1862-63	3.50@ 4.00	3.65@ 4.45	3.90@ 5.00	4.10@ 5.25	.....
1863-64	5.50@ 6.50	5.50@ 7.25	6.25@ 7.75	7.50@ 8.25	.....
1864-65	12.00@13.00	12.25@15.00	13.00@15.25	12.50@14.00	.....
1865-66	.....	9.25@11.00	9.00@11.00	10.00@11.35	10.50@11.35
1866-67	7.00@ 9.50	6.00@ 7.75	6.75@ 7.30	7.00@ 7.75	7.75@ 8.50
1867-68	5.50@ 7.50	7.00@8.37½	7.25@ 8.30	7.60@10.25	.....
1868-69	.....	8.75@11.75	11.00@13.00	12.00@14.50	11.00@13.00
1869-70	11.00@13.25	10.00@13.25	10.00@11.00	10.00@10.75	9.50@10.25
1870-71	7.25@ 8.25	6.50@ 7.90	7.00@ 8.75	8.25@ 8.75	7.00@ 8.00

The disease known as *hog cholera*, which has been so destructive in Illinois and Iowa, and in some portions of the west, has but rarely been heard of in this state—perhaps we

may say not at all, except in a very few cases in the southern counties.

In Iowa the cholera has prevailed to such an extent that whole herds of fifty to a hundred hogs have been carried off by it within a few days. Various remedies have been tried, but none seems to have so far gained the confidence of the farmers as to be considered a cure.

Some Iowa farmers, with whom we have conversed on the subject, report that they have succeeded in saving their herds, without the loss of a single animal, by extra care in keeping their bedding places clean—renewing the straw often and changing their location frequently—by preventing their nesting together in considerable numbers, and by giving them constant access to stone coal.

POULTRY.

We have no statistical sources of information as to how much is doing in our state in the raising of poultry; nor is there reason to believe that it has any considerable amount of special attention.

The Chamber of Commerce reports the receipt of 11,841 packages of eggs by rail and water in 1870; the said packages being equivalent to something like 10,000 barrels.

The prices ranged between 22 and 31 cents per dozen, during the winter months, 12½ and 22 during the summer, and between 12½ and 26 during the autumn.

With more care in the selection of the best breeds and such further attention to matters of feeding, nesting, etc., as the children could give as well and better than not, if properly instructed, the raising of poultry and eggs for the market might be made a very considerable, though incidental source of revenue, besides supplying the farmers' tables with wholesome luxuries of which they are quite too often denied at present.

BEE-CULTURE

Has had its ups-and-downs in Wisconsin, as in most other portions of our country. Whether our people have not learned the art of protecting the swarms during the cold of winter, or of providing them with proper pasturage in summer, or whatever the reason of their partial success, it is a fact that bee-culture is but little in advance of what it was ten years ago. Herein we differ from Iowa, in that, while we have made but a small gain, in that state there has been a falling off, as will be seen by the following :

STATEMENT of amount of Beeswax and Honey produced in Wisconsin and Iowa.

Season.	Wisconsin.	Iowa.
1850	131,005	321,711
1860	207,294	917,877
1870	299,347	639,713

It is worthy of remark, however, that a few of our bee culturists who have taken pains to provide themselves with Italian bees, and have mastered the perhaps not easy art of taking care of them, have made it a most profitable business ; in proof of which reference is made to the accompanying communications from Messrs. Wm. Wolff and Adam Grimm, both of Jefferson, Wisconsin.

One of these gentlemen—Mr. Grimm—who has been in the business some six years, commenced the season of 1870 with 600 colonies, which number was increased during the summer to 903. Of these he sold 449 colonies ; sending them to all parts of the country, though more particularly into Utah, and realizing from \$11 to \$15 per hive. The total amount of honey produced by him during the year, was 22,725 pounds. What he sold averaged him nineteen cents per pound, all expenses deducted.

Mr. Grimm winters his bees in cellars, and loses not to exceed one and one half per cent.

In view of his remarkable success in thus producing about one-tenth of the annual honey product of the whole state, it

should be mentioned that he keeps the Italian bees exclusively and uses the Langstroth hive.

Mr. Wolff's business, although not so extensive, thus far, as Mr. Grimm's, has been conducted in the same general manner and has been attended with like success.

In concluding this discussion of the agricultural interests of the state, we present, for the convenience of any who may wish to make comparisons of the most important aggregates, the following:

TABLE illustrating the Agriculture of Wisconsin in 1860 and 1870.

	1860.	1870.
Improved land or farms, acres	3,746,167	5,899,343
Unimproved...do.....do	4,147,470	5,815,978
Cash value of farms	\$31,117,164	\$300,415,954
Value of farming implements and machinery ..	5,758,847	11,000,000
Amount of wages paid, including board .....	.....	8,186,110
Number of horses	116,180	.....
Mules and asses	1,030	252,019
Milch cows.....	203,001	308,377
Working oxen.....	93,652	52,615
Other cattle	225,207	331,301
Sheep	332,954	1,069,280
Swine	334,055	512,778
Value of all live stock	\$17,807,375	\$45,310,882
Value of animals for slaughter.....	3,365,261	11,914,643
Wheat, bushels.....	15,657,458	25,605,344
Rye, bushels	888,544	1,325,294
Indian corn, bushels.....	7,517,300	15,033,998
Oats, bushels.....	11,059,260	20,180,016
Barley, bushels.....	707,307	1,065,019
Buckwheat, bushels.....	38,987	418,897
Peas and beans, bushels.....	99,487	388,425
Potatoes, Irish, bushels.....	3,818,309	.....
Potatoes, sweet, bushels.....	2,396	2,220
Tobacco, pounds.....	87,340	960,813
Grass seed, bushels.....	26,512	13,016
Clover seed, bushels	3,852	2,906
Hay, tons	855,037	1,287,651
Hops, pounds.....	135,587	497,398
Flax, pounds	21,644	497,398
Flax seed, bushels.....	4,256	114,019
Maple molasses, gallons.....	83,118	31,218
Sorghum molasses, gallons.....	19,854	74,478
Value of orchard products.....	\$78,690	\$819,268
Value of market-garden products	208,730	226,665
Wine produced, gallons	6,278	3,357
Butter, pounds	13,611,328	22,473,036
Cheese, pounds.....	1,104,300	1,592,798
Milk sold, gallons.....	.....	2,059,105
Honey, pounds	207,294	299,347
Beeswax, pounds	8,008	9,945
Estimated value of farm productions of the year	\$36,336,498	\$78,027,032

MINING.

Although we have but little to add to what has been said in our last two reports under this head, some circumstances of considerable interest deserve mention.

The lead interest has been somewhat encouraged by the legislative provisions of 1870, for a survey of the lead region, now in progress. This important act originated in a strong desire on the part of large numbers of intelligent people of the lead district, for a more careful and full examination into the reasons which induced Prof. J. D. Whitney, of the late Geological Commission, to discourage the hope of making deep mining successful.

Commissioner Murrish, to whom your Excellency entrusted the responsible duties of conducting these investigations, appears to have entered heartily into the work during the past season, and is still pursuing his labors in the expectation of concluding them during the current year. He possesses excellent qualifications for the task assigned him, and great interest is felt in his forthcoming report, which it is understood will warrant, at least in part, a reversal of the judgment pronounced in 1860.

The correct settlement of the questions involved is a matter of great importance to the state, inasmuch as the investment of large amounts of capital, home and foreign, in the business of thorough mining will turn upon its decision.

It is also worthy of mention, in this connection, that deposits of lead ore were found during the past year near Rio, in Columbia county. We are unable to state, on the basis of the limited explorations hitherto made, how extensive these deposits are likely to prove, but the fact, which is unquestionable, is of itself interesting.

The iron interest, still further stimulated by the progress of iron manufacture at Milwaukee, and by the demand springing up in the west, as mentioned in our last report, for the Dodge county ore, has been of late somewhat feverishly excited over the announcement of very extensive deposits of the magnetic

ore at the headquarters of the Menomonee river. We are not yet able to make authoritative statements concerning them, but feel warranted, by the information otherwise received, in quoting the following paragraphs from the *Chicago Post*, of May 11, 1871, as in all probability quite reliable:

"Late examinations of the country about the head waters of the Menomonee river in Wisconsin have revealed enormous deposits of iron ore of the purest and best quality, rivaling in quantity the well known ranges of Lake Superior. The existence of this metal in that section was reported more than twenty years ago by Messrs. Foster and Whitney, when making a geological reconnoissance from the lake to Green Bay, but they merely noted the fact from the great variations of the needle, and had no opportunity to measure the extent of the beds, or apply necessary tests to determine their value. Four distinct ranges of hills have now been found, running nearly parallel, and about twenty miles in length, which are little else than solid iron, and are no doubt cotemporaneous with the trap formations of Superior, from which they are about eighty miles distant. Now that settlements have penetrated the country, these mines will attain a speedy value, and may lead to important modifications in the upper-lake trade. A railroad from these undeveloped mines would have a down grade to the Bay, and ore could be quite as easily delivered as on the present route between Ne-gaunee and Escanaba, and probably at even cheaper rates."

It is a matter of regret that the statistics of mining furnished by the census returns are so scattering and incomplete that no correct idea can be formed of the amount of lead, zinc and iron ores raised during the past year. We deem it but just, therefore, to omit them altogether.

The minerals of Wisconsin constitute a very important part of her rich natural endowment, and the time cannot be very remote when they will begin to receive the attention they deserve.

LUMBERING.

Though properly classifiable with Manufactures, the business of lumbering is so unlike anything else, and is so vast, moreover, in the amount of capital employed, and in the value of the annual product, that it has usually been discussed by us under a separate heading, as a distinct interest.

The season of 1870, although not the most favorable, in all

respects, nevertheless yielded large results. Indeed there seems to have been a rapid growth of the business from year to year, until the thoughtful citizen is forced to think with some anxiety of the time surely—and shall we not say rapidly?—advancing when there will be no more forests to invade and destroy.

In 1860 the capital invested in lumbering amounted to \$5,595,380, the cost of material was \$1,965,031; the value of the product, \$4,377,880.

In 1863 we ventured the estimate of 800,000,000 feet of lumber as the product and \$10,000,000 as the value of the lumber and shingles manufactured that year. There were some who criticised these figures as being above the mark, though the best informed lumbermen confirmed them. What now will the doubters say in the face of the census returns, which show a valuation of the annual product of 1870 equal to \$14,486,673.

That the comparison between 1860 and 1870 may be the more easily seen, we repeat the figures in tabular form.

TABLE showing the extent of the Lumbering business in 1860 and 1870.

YEARS.	Capital Invested.	Cost of Material, etc.	Value of Pro- ducts.
1860.....	\$5, 595, 380	\$1, 965, 031	\$4, 377, 880
1870.....	11, 206, 465	7, 243, 949	14, 486, 673

As the returns made by some of the counties were less than complete, it is safe to state the value of the lumber product at \$15,000,000.

It is worthy of note, as a further offset to the discomfort that one feels at this immense destruction of the forests, that about each of these active centres, where the business is conducted, thriving villages are springing up; while in hundreds of localities the productive industry of the husbandman quickly succeeds to the destructive waste made by the relentless woodman.

For this reason, the manufacture of lumber in our own

state should be encouraged, rather than that bare cutting of logs and rafting them down the Mississippi, for sawing elsewhere, which, by some of our lumbermen, is practiced to so great an extent.

MANUFACTURES.

We have treated of this great state interest at such length in our last two volumes, that this discussion may be chiefly confined to the bare statement of what progress the state is making therein.

Exclusive of lumbering, which, as before remarked, it properly embraces, it ranks next to agriculture in the amount of its annual product, and the importance of its relation to the social welfare of the state.

Manufacturing not only affords employment and support to a great number of people, thereby fulfilling an important office in political economy, but it furnishes them with a *kind* of employment admirably suited to encourage intellectual activity; to establish all who engage in it in habits of promptness and regularity; to permanently fix in them a conviction of the value of *system* and of the wise and provident adaptation of means to ends; and finally, through the constant use of *constructive* rather than *des-structive* methods, the better to qualify them for the duties of both private and public life. Hence it is that we find our manufacturing communities characterized by an intelligence, a faithfulness, and a morality not so commonly found among the working population of the commercial port, the mines, or the lumber-camp.

These considerations, added to the advantages of furnishing a home market for the raw materials used, as well as for large supplies of such products of agriculture as are needed for food, and of saving to our people the cost of transporting the manufactured articles of every kind consumed by them from the remote places of their manufacture elsewhere,—these constitute a powerful argument in favor of such encouragement to this branch of our industry as may be afforded without injustice to the others.

Under such circumstances as have marked the past ten years, this interest has made astonishing strides. No other has equaled it.

Let us compare some of the figures of 1860 and 1870, noting, more especially, those branches of manufacturing industry which have assumed the greatest importance.

Of the extensive manufacture of lumber we have already spoken under a previous heading.

The manufacture of flour, which in 1860 amounted to the large sum of \$11,510,834 in value, has advanced at a rate exceeding 33 per cent. ; the total value of the product for 1870 being \$17,580,648.

Cheese factories have sprung up in our state with astonishing rapidity. The whole number now in operation is said upon good authority to be scarcely less than 125. With great effort we have obtained statistics from 75, which are accordingly presented in the following table.

TABLE showing the location, names of proprietors, and amount of business done by the leading Cheese Factories of the State, in 1870:

County.	Firm.	Postoffice Address.	Length of Season.	Capital.	Pounds of Milk.	Pounds of Cheese.	Value.
Dane	J. C. Baker	Madison	Mos.	\$1,600	.....	.....	\$1,150
....do....	William Wilson	Burke	4	2,500	180,000	16,048	2,568
Dodge	D. Boynton	Burnett	4	4,000	405,000	40,500	6,075
....do....	C. Kuenzie	Watertown	6	500	220,000	23,000	3,500
....do....	C. C. M. Hodge	Leroy	.....	1,200	.....	31,000	4,500
....do....	M. Burnett	Burnett	.....	3,750	492,000	49,200	7,360
....do....	C. Wellauer	Hustisford	6½	5,000	634,086	63,408	8,877
Fond du Lac	Cold Spring	Fond du Lac	5	2,500	.....	30,000	4,950
....do....	Spafford's	....do....	6¼	12,000	120,000	12,371	1,973
....do....	Wm. Starr	Ripon	.....	.....	418,205	41,820	4,854
....do....	G. Downey	Waupun	.....	2,000	19,850	1,985	258
....do....	E. S. Jenkins	....do....	5	1,800	664,000	63,000	9,430
....do....	C. Hazen	....do....	6½	4,000	1,420,330	184,643	22,940
....do....	J. Howard	....do....	6	1,000	540,500	54,000	8,500
....do....	Strong & Hammond	Oakfield	6½	3,000	.....	54,023	8,914
Grant	.....	Hazel Green	.....	.....	.....	.....	.....
Green	Crowell & Benson	Albany	3	1,500	350,000	2,800	450
....do....	M. L. Barney	....do....	4½	700	44,500	6,300	956
....do....	J. Gang	....do....	2	2,200	102,600	12,000	1,800
....do....	M. Zumbrenen	....do....	2	2,800	73,800	7,300	1,095
....do....	E. W. Cheeseboro	....do....	2	800	20,400	2,700	350
....do....	J. Smith	Brooklyn	4	3,000	48,400	4,840	726
Green Lake	S. Hazen	Green Lake	5	1,200	405,000	45,000	7,700
....do....	Ward & Harrington	Berlin	1	1,000	60,000	6,000	900
....do....	James Cowe	....do....	6	10,000	240,000	22,000	3,470

Jefferson.....	O. Gates & Co.....	Oakland	6	3,000	98,000	10,890	1,633
do.....	Fort Atkinson Co.....	Fort Atkinson.....	6	3,000	205,938	18,922	3,236
do.....	Cold Spring Co.....	Whitewater.....	8	5,000	1,816,410	191,000	28,650
do.....	Wheeler & Halm.....	Cold Spring.....	8	5,000	172,000	17,973	2,900
do.....	S. Favill.....	Lake Mills.....	7	2,000	1,000,000	100,000	16,000
Kenosha.....	Johnson & Co.....	Kenosha	7 $\frac{1}{2}$	2,800	732,360	60,000	8,240
do.....	D. Winslow.....	Somers.....				20,000	
do.....	H. G. Blackman.....	Kenosha	3	1,000	68,930	6,893	827
do.....	Beath & Marsh.....	do.....		2,200		45,000	
do.....	R. Houston's.....	do.....		2,120		74,000	
do.....	Blackman Bro's.....	Paris.....				50,000	
do.....	Crane's.....	do.....				25,000	
do.....	McGuire's.....	Brighton.....				15,000	
do.....	Hartnell's.....	do.....				15,000	
do.....	Munson's.....	Salem.....				50,000	
do.....	Booth's.....	do.....				20,000	
do.....	Kelloggs'.....	Bristol.....				12,000	
do.....	Vincent.....	do.....				20,000	
do.....	Reichmeyer's.....	do.....				20,000	
do.....	Carpenter's.....	Pleasant Prairie.....				20,000	
do.....	Holt Bros.....	do.....				75,000	
do.....	White's.....	do.....				50,000	
do.....	Treusdell's.....	do.....				75,000	
do.....	Wilbur & Co.....	Salem.....					
do.....	W. Benedict.....	do.....			293,929	30,326	
La Fayette.....	Richardson & Co.....	Benton	6	1,600	60,000	6,000	960
La Crosse.....	R. B. Gray.....	West Salem.....	6 $\frac{1}{2}$	900	142,847	14,300	2,002
Monroe.....	Brown & Gray.....	Sparta.....	5 $\frac{2}{3}$	1,282	280,747	28,630	4,008
do.....	A. Emery & Co.....	do.....	5	2,500	160,994	16,050	2,247
Outagamie.....	L. Perrott.....	Wakefield	6	1,200	14,400	4,450	712
Richland.....	J. H. & S. J. Carswell.....	Richland.....	8	1,500	187,000	15,000	1,900
Rock.....	C. H. Wilder.....	Evansville.....	6	5,000	960,660	96,793	14,915
do.....	Afton & Co.....	Afton.....	4	2,000	100,000	10,000	1,500
do.....	Lima.....	Lima.....	2	3,000	103,600	10,360	1,450

TABLE showing the location, names of proprietors and amount of business done by the leading Cheese Factories—continued.

County.	Firm.	Postoffice Address.	Length of Sea- son.	Capital.	Pounds of Milk.	Pounds of Cheese.	Value.
Rock	Milton Co.....	Milton.....	1	\$1,500	98,180	9,818	\$1,375
do.....	C. Ross.....	Shopiere.....	2	2,500	500,000	50,000	7,625
do.....	Robbins & Smith.....	do.....	6	1,500	129,300	12,930	1,939
Sauk	N. W. Morley.....	Baraboo.....	6	2,000	125,664	13,200	2,100
do.....	C. & D. Beckwith.....	Lone Rock.....	9	1,070	362,942	36,294	5,820
Sheboygan.....	Holden & Co.....	Sheboygan Falls.....	2	300	.....	1,100	140
do.....	L. P. Fisher.....	do.....	.....	2,500	.....	46,000	6,900
do.....	Hiram Smith.....	do.....	8	700	.....	23,330	3,500
do.....	Hiram Conover.....	do.....	8	800	200,000	20,000	3,000
do.....	D. Deland.....	do.....	6	4,600	120,000	12,000	1,680
do.....	D. Kuntz.....	do.....	1	700	90,000	9,000	1,120
do.....	A. G. Dye.....	do.....	1	2,500	30,000	3,000	400
do.....	T. Strong.....	do.....	7	400	140,000	14,000	1,750
Walworth	Bent & Co.....	Sharon.....	5	3,000	1,080,000	82,500	11,550
do.....	Coburn & Son.....	Whitewater.....	8	7,000	730,500	65,735	9,860
do.....	T. M. Cole.....	Darien.....	8	2,000	300,000	30,000	3,500
do.....	S. Noyes.....	do.....	6	2,500	350,000	28,000	3,360
Waukesha	Summit Cheese Factory.	Oconomowoc.....	.....	.....	*	.....	.....
				\$149,722	16,213,152	2,473,354	\$271,095

* MHk of 250 cows.

The manufacture of agricultural implements was carried on to a very limited extent in 1860, when the total value of its products was \$735,198. Since that day, most of the leading establishments then in operation have been greatly enlarged, and not a few new ones added, some of them—the Geiser Threshing Machine Co., Racine, is a notable example—of great extent and importance.

It may be remembered, that in our report of 1868, we estimated the total value of the products of this general business at about \$4,000,000. This was probably not far from the mark. Since that, there seems, for some cause or causes, to have been a falling off in the manufacture of reapers and of seed-drills; perhaps, also of other implements. At all events the census returns of 1870 show an aggregate of but \$2,890,437.

In explanation of this decrease, we suggest the fact of an over-production in 1868, not yet fully recovered from, and secondly the increasing number and active efforts of agencies established in the interest of eastern manufactories. With gaining facilities for getting the raw material and for shipping the bulky products of their manufacture to all parts of the state and country, the present comparative quietness in this branch of business cannot be more than very temporary.

Leather manufacture has made rapid growth within the recent years. In 1860, the total product had a valuation of less than half a million of dollars. To-day it is not less than \$3,000,000. In this branch, Milwaukee, whose annual production has always been proportionally large, has made great advancement. On this head we quote at some length from the report of the Chamber of Commerce for 1870 and from the Milwaukee Sentinel:

“ Milwaukee has long been noted for the great extent of the hide and leather business carried on here, and this branch of our manufactures has been augmented during the past year by the erection in this city of the most complete and extensive leather manufactory to be found in any part of the country, the tannery of the Wisconsin Leather Company on the Kinnickinnick, in the Fifth ward. This establishment was completed in August

last, and some idea of its extent may be got from the fact that the roofing of the various buildings covers an area of 56,625 square feet, or nearly one and a half acres. The beam house is 92 by 104 feet and contains sixty large double vats. The yard is 280 by 64 feet, and contains two hundred and fifty double vats, equal to five hundred of the ordinary size. The grinding and leaching house is 232 feet long by 32 feet wide. The engine house is 52 by 35 feet, and contains the main engine and three boilers, each 26 feet long by 44 inches in diameter. This building has an iron roof and is wholly fire proof. The chimney is one hundred feet high, and the only fuel used is the spent tan bark which is burned wet as pitched from the leaches. The finishing building, or currying shop is 204 feet by 70 and is two stories high, containing all the modern improvements for finishing leather. This building has attached an engine house, engine and boilers of its own. * * The receiving house is 44 by 80 feet, and one or two other smaller buildings with six hundred feet of improved dock line on the Kinnickinnic river, used for receiving tan bark, fuel and other heavy freight from vessels, completes the manufacturing department of the establishment."

"The tannery is devoted exclusively to the manufacture of upper and harness leather, and so is called by the trade an upper leather tannery. It is supposed to be the largest upper or harness leather tannery in this country, or in the world. It has not as yet been worked to its average capacity, which is stated to be the tanning and finishing of about 7,000 hides per month or 168,000 sides of leather per annum."

The following from the Milwaukee *Sentinel*, concerning the sole-leather tannery of this same company, is also full of interest as further illustrating the extent of leather manufacture conducted by Milwaukee men:

"The Wisconsin Leather Company has also a large sole-leather tannery at Two Rivers, in this state, which they continue. The tannery has 150 double vats, and is the largest sole-leather tannery in the west. They had a large upper leather tannery also at Two Rivers, which is now discontinued, and merged into the larger one built here. The trade of this company is very heavy, and extends through a large portion of the states. Hitherto they have been wholly unable to meet the demands upon them, often having orders two months ahead of their ability to fill them. Such is the character and reputation of their harness leather, of which they have made a specialty, that it is purchased from them by heavy saddlers in New York, Philadelphia and other eastern cities. And what may be a little remarkable in a western house, over 90 per cent. of their sales are to parties residing and doing business in the eastern and southern states."

"In addition to the works of the Wisconsin Leather Co., our city can boast of a number of other heavy establishments engaged in the manufacture of

leather, all in a highly prosperous condition. The extensive establishment of Mr. Guido Pfister is probably as widely and favorably known as that of the Wisconsin Leather Co., though perhaps throughout different parts of the country. Two hundred thousand sides of leather would be a moderate estimate of this branch of our manufactures during the past year, with a prospect of a steady increase hereafter."

Iron manufactures are at present outrunning all others. The total value of products of this kind in 1860 was \$372,960. In 1869, as shown by the census of 1870, it had reached \$2,639,175. A very large proportion of this increase may be placed to the credit of the new Iron Company's establishment at Milwaukee.

A lengthy account of this company's work and operations was given in our report for 1869. But meantime so many improvements and additions have been made, that we gladly make room for the following statements contained in the report of the Chamber of Commerce, to which reference has been made so often already :

"The Milwaukee Iron Company has been in operation but three years, and it has already become one of the most extensive manufacturing concerns in the northwest, and at the rate of progress it has made thus far, it promises ere many years to become as extensive and complete as any other establishment of the kind in existence.

During the past year the company have added a new puddling mill to their works, 80 by 230 feet, built in the most substantial manner, in which six single and seven double furnaces have been put in operation with room for four more, increasing the product of the mills three hundred tons of pig iron per week. The furnaces and machinery are of the very best description, as are all the machinery and appointments of these works. The company have also built a new blast furnace similar to the first one built by them a year ago. The two furnaces can make 30,000 tons of pig iron per annum. The rolling mill works have been largely increased, and are now turning out 2,400 tons of finished railroad iron per month. The immense freightage business of this company, and its prospective, as well as present importance to the carrying trade will be appreciated when it is known that during the past year, with its works yet incomplete, it received 37,544 tons of coal from Cleveland, Erie and Buffalo, 17,060 tons of ore from Lake Superior, 11,355 tons of coke from Pennsylvania by rail, and 96,000 tons of iron ore by rail from Iron Ridge in this state. Of the latter, 67,700 tons were shipped, mostly by lake, to Chicago, Wyandotte, Cleveland and Erie, 28,000 tons being used here.

"To facilitate the shipment of Wisconsin iron ore now extensively used at Cleveland, Wyandotte and Chicago, the company has built upon their harbor frontage near the mouth of the Milwaukee river, an ore dock, or timber structure one hundred and sixty-one feet long, twenty-eight feet wide and forty-three feet high, having twenty-six bins or "pockets," as they are called, lined with heavy plate iron, each capable of holding one hundred tons of ore. At the bottom of each of these pockets is a spout or shoot, through which the ore is discharged into the hold of a vessel, controlled by simple machinery above. The ore is brought by rail from the beds owned by this company at Iron Ridge, in cars constructed expressly for this purpose, and is conveyed to the top of the docks by means of an inclined plane resting on eleven hundred feet of trestle work, and dumped directly into the pockets. A train of six cars, carrying ten tons each, is readily drawn up this incline by the company's locomotive. The latter, a first-class engine, is constantly employed at this work and the transferring of material between the rolling mill and the docks, a distance of about half a mile. The company also have a substantial pier extending from their works directly into the Bay, at which their supplies of coal and Lake Superior ore are principally discharged, giving them very complete receiving and shipping facilities.

"Mr. J. J. Hagerman, the energetic business manager and secretary of the company favors us with the following interesting particulars of operations during the past year :

" ' MILWAUKEE, March 16, 1871.

" ' W. J. LANGSON, Esq :

" ' *Secretary Milwaukee Chamber of Commerce,*

" ' DEAR SIR:—In reply to your note of 8th would say, we have received during 1870.

" ' 26,728 tons soft coal from Cleveland and Erie, by vessels.

" ' 17,060 tons iron ore from lake Superior, by vessels.

" ' 10,816 tons anthracite coal from Buffalo, by vessels.

" ' 11,355 tons of coke by rail from Pennsylvania.

" ' 7,780 tons limestone from Racine.

" ' 95,000 tons of iron ore were received over the St. Paul Railway, from Iron Ridge. Of this 28,000 tons were used here, and 67,000 tons shipped.

" ' In 1870 we made 16,248 tons railroad iron. Of this 4,875 tons was re-rolling, and balance new iron.

" ' No. 1 Blast Furnace was put in blast, April 16, 1870. From that time until December 31, (38 weeks) it made 12,830 tons of pig iron. All this was used here, excepting 3,763 tons shipped to Wyandotte.

" ' During the past year the works of this company have been very much extended, and we are now turning out 2,400 tons of rails per month. No. 2 Blast Furnace is nearly ready to "blow in," and the two can easily make 30,000 tons of pig iron per annum. During 1870 this company has paid out *for labor* at the mills and docks \$413,673.15. If to this you add the money paid for railroad and vessel freights, foundry work, lumber, stone, brick, lime and other materials, you can form some idea of the money put in circulation by *our* manufacturing concern. The above figures do not include payments for labor at Iron Ridge amounting to about \$12,000 per month.

" ' Yours, &c.,

" ' JAS. J. HAGERMAN.' "

Wagons and carriages are also manufactured on a scale that entitles them to special attention. Racine and Kenosha still hold the supremacy. In these two counties, the amount of capital invested, the cost of material used and the value of the wagons and carriages manufactured in 1870 were as follows:

	Racine.	Kenosha.
Capital invested.....	\$247,100	\$121,100
Cost of materials.....	174,321	145,607
Value of manufactures.....	830,000	340,740

The amount of capital invested in the business in all parts of the state is reported at \$1,144,215; expenditures for material, \$862,493; value of product, \$2,720,463.

Woolen factories have increased in number, since 1860, from 11 to 48; in amount of work done, in about the same rates.

	1860	1870
Capital employed in woolen mills.....	\$100,600	\$1,235,089
Value of wool used.....	85,743	557,820
Number of hands employed.....	105	577
No. pounds of yarn reported*.....	.....	56,000
No. pairs blankets reported*.....	.....	7,750
No. yds. of cloth reported*.....	.....	1,009,949
Total value of products.....	172,720	1,094,858

For particulars concerning this interesting and highly important branch of manufactures, reference is made to the accompanying tables.

* Many mills made no report of yds. of cloth, some no report of yarn, and others none of blankets in cases where it is known that such were actually manufactured.

TABLE showing the Location, amount of Manufacture, etc., of the Woollen Factories of the several counties of the state.

County.	Firm.	Address.	Capital.	Number Hands.	Amount Material.	Cost.	Product.	Value.
					Wool, lbs.		Yards.	
Columbia	D. D. Roberts	Randolph Center ...	\$8,000	4	6,000	\$3,150	3,900	\$4,961
Crawford	F. Thomas.	Prairie du Chien ...	10,000	20	9,000	4,480	10,750	8,125
Dane	Thornton & Gripper	Madison	42,000	15	.....	16,600	40,000	35,000
....do	Geo. Dow & Son	Cambridge	10,000	6	.....	3,950	4,800	4,200
Dodge	T. P. Bliss	Neosho	2,500	.....	.....	4,500	.....	4,150
....do	Moore, McClure & Co	Williamstown	30,000	8	.....	11,000	18,000	18,000
....do	McFetridge & Co	Beaver Dam	50,000	.....	.....	37,125	^a 2,500 ^b 6,000 ^c 70,000	71,000
....do	Chandler, Congdon & Co .....	....do	50,000	32	.....	23,500	2,000 60,600	58,200
Fond du Lac	Empire Woollen Mills	Fond du Lac	20,000	11	15,000	5,000	15,000	15,000
Grant	Lancaster Woollen Co.	Lancaster	60,000	25	75,000	22,500	60,000	45,000
....do	N. W. Bass	Platteville	10,000	8	12,000	4,975	.....	9,600
....do	Smith & Mequon .....	....do	7,000	5	6,000	2,400	.....	4,800
....do	J. Horsfall	Millville	9,000	8	5,500	2,200	3,075	4,553
....do	Wm. Best	Little Grant	1,000	2	6,000	3,000	1,500	1,525
Green	J. Kelly	Oakley	3,000	.....	.....	3,800	.....	7,600
....do	E. Elliott	Farmers Grove .....	.....	.....	.....	.....	.....	.....
....do	Monticello Woollen Co.	Albany	20,000	14	25,000	9,050	.....	13,877
Green Lake	Berlin Woollen Co.	Berlin	30,000	18	.....	.....	.....	.....
....do	E. Quick	Dartford	9,000	11	9,340	5,136	15,431	15,692
Iowa	Oldham & Jones	Miffin	10,000	6	8,000	2,500	.....	4,070
Jefferson	Jefferson Woollen Co.	Jefferson	51,389	20	37,910	17,844	35,174	32,145
....do	D. Jones & Co.	Watertown	30,000	10	10,000	4,500	45,000	7,875
Manitowoc	Vilas & Co.	Manitowoc	40,000	.....	35,000	14,000	^a 5,000 ^b 5,000 ^c 24,000	26,000

Monroe	T. B. Tyler & Co.	Sparta	15	24, 000	11, 600	19, 500	16, 750
Marquette	Whitney & Stimson	Westfield	6	7, 000	1, 554	3, 300	3, 190
do.	Fuller, Clark & Fuller	Harrisville	5	10, 000	1, 290	2, 182	2, 157
do.	Wells & Scobie	Neshkoro	3	4, 000	1, 400	3, 500	3, 100
do.	E. Dienelt	Milwaukee	1	1, 000	1, 425	1, 000	1, 875
do.	Esch & Bros.	do.	12	15, 000	12, 992	15, 600	20, 582
do.	H. Harpake	do.	6	8, 500	3, 200	4, 982	4, 950
do.	Hutchinson, Fay & Bullard	Appleton	36	80, 000	40, 000	80, 000	90, 000
do.	Hilgen & Wittenberg	Cedarburg	24	65, 000	30, 220	20, 000	49, 594
do.	Lawton & Perkins	Burlington	15	25, 000	13, 300	75, 000	15, 000
do.	Blake & Co.	Racine	50	100, 000	35, 654	15, 000	125, 000
do.	W. H. Pease	Evansville	5	8, 000	4, 800	4, 000	7, 600
do.	Payne & Hastings	Janesville	8	70, 000	35, 145	60, 000	59, 100
do.	do.	do.	8	30, 000	8, 500	25, 000	21, 750
do.	J. Bomier	Richland Center	7	5, 000	3, 530	1, 000	6, 700
do.	J. Dean & Co.	Baraboo	12	10, 000	7, 000	2, 000	13, 900
do.	Island Woolen Factory	do.	35	60, 000	48, 800	15, 000	94, 400
do.	Breckner & Heald	Sheboygan Falls	18	20, 000	15, 300	33, 000	39, 700
do.	Hills & Clark	do.	11	25, 000	13, 450	50, 000	61, 300
do.	Chapman & Co.	Menasha	30	40, 000	33, 000	80, 500	3, 000
do.	Paris & Ellsworth	Waukau	2	5, 500	1, 600	3, 000	3, 000
do.	A. Patyn	Cedar Creek	13	26, 000	2, 020	6, 375	11, 437
do.	Procter & Co.	Eagle	5	3, 200	6, 930	23, 000	25, 800
do.	Waukesha Co.	Waukesha	18	60, 000	9, 800	26, 000	23, 600
do.	Dayton, Dewey & Co.	Waupaca	17	30, 000	13, 100	1, 009, 949	\$1, 094, 858
Totals	do.	do.	577	\$1, 236, 089	\$557, 820	1, 009, 949	\$1, 094, 858

c Pairs of Stockings.

b Pounds of Yarn.

a Pairs of Blankets.

Wool *carding* is not included in the above statement. So far as returns have been here received, the amount of capital invested in this branch of woolen manufacture is \$19,000; annual expenditures for material, \$26,655; value of annual product of rolls, \$49,583.

The wooden and willow-ware business, though less in magnitude, may be properly mentioned in this connection. The manufacture of wooden-ware, such as baled boxes, bowls, pails, etc., is most of it done at Neenah and Menasha, Depere and Green Bay; the total value of the product in Winnebago and Brown counties being:

Winnebago county.....	\$192,550
Brown.....	51,840
	<hr/> <hr/>

Stated more in detail, the factories at the three places named are reported as follows:

	Menasha.	Depere.	Green Bay.
Capital invested.....	\$125,000	\$20,000	\$140,000
Expenditures for material, 1870.	97,835	8,450	.....
Hands employed.....	200	40	.....
Paid for labor.....	82,500	14,400	.....
Value of product.....	192,550	37,840	14,000
	<hr/> <hr/>	<hr/> <hr/>	<hr/> <hr/>

The articles manufactured at Menasha in 1870 were:

Pails.....	240,000	Fish kits.....	95,000
Wash tubs.....	60,000	Butter tubs.....	50,000
Wash boards.....	12,000	Kulers.....	10,000
Measures.....	6,000	Bannakins.....	50,000
Churns.....	14,400	Broom handles....	80,000
Covers.....	18,000	Clothes pins.....	6,000,000
	<hr/> <hr/>		<hr/> <hr/>

The manufactures at Depere were: butter tubs, 31,707; fish kits, 74,950; oak pails, 9,004.

Those of Green Bay consisted of 60,000 fish kits.

The manufacture of willow-ware is chiefly confined to Milwaukee, we may say, in fact, to one establishment, that of Mr. Adolph Meinecke; whose business is sufficiently large, however, to warrant the distinction of a special notice in this place.

Beginning in a small way, this enterprising gentleman has steadily extended his business until his buildings, which are new and in all respects admirably adapted to their uses, now occupy a large area in the heart of the city, and are the scene

of much activity. He has in constant employ 200 to 250 men, women and youths, and is shipping the products of their labor to all parts of the country. The census credits him with capital to the amount of \$56,000; expenditures for material, \$10,000; and a product valued at \$72,000. He has since made important additions and could show larger results.

The *manufacture of straw board* for building purposes, of which an account was given in the last report, continues to increase. The Beloit factories are annually converting immense quantities of straw into board, which, when put up in rolls like carpeting, is sent to all parts of the United States and even to other countries. From using it as a roofing and siding material for house-building, they are now substituting it for plaster with very satisfactory results.

As this is a Wisconsin invention, we feel a special pleasure in again calling the attention of our readers to the eminent success with which it is being carried on by the Rock River Paper company.

Malt and spirituous liquors must not be omitted from this brief enumeration of the leading branches of Wisconsin manufacture.

The amount of highwines manufactured in the state during the year 1870 we are unable to arrive at without more labor than we are able to give. The amount produced at Milwaukee is reported at 914,684 gallons, equal to about 46,000 barrels of rectified whisky—larger by some 5,000 barrels than ever before.

The manufacture of malt liquors steadily increases. In 1870 there were:

Capital invested in breweries	\$2,283,400
Expenditures for material	\$991,560
No. barrels of beer reported	211,503
No. barrels of beer not reported*.....	12,443
Value of product.....	\$2,329,572

In Milwaukee alone, a city more famous than any other in America for the amount manufactured, and the quality of its beer, more than a million dollars worth of lager beer was

* Estimated from total value given.

manufactured last year. What the future promises may be calculated from the following :

STATEMENT showing the manufacture of Lager Beer at Milwaukee for six years

1865, barrels	65,666
1866, barrels	68,758
1867, barrels	82,523
1868, barrels	72,522
1869, barrels	90,500
1870, barrels	108,845

For the sake of presenting the foregoing statistics in a more convenient form for comparison, we group them in this :

TABULAR STATEMENT of the capital invested, expenditures made and proceeds realized in general leading branches of Wisconsin Manufactures:

Articles Manufactured.	Capital Invested.	Paid for Material.	Value of Product.
Flour	\$6,458,042	\$13,959,584	\$17,580,648
Lumber.....	11,659,765	7,263,204	14,550,653
Leather manufactures.....	1,423,868	1,409,083	2,956,585
Machinery, castings, etc.....	1,682,124	1,045,261	2,639,175
Agricultural Implements.....	1,822,925	902,232	2,890,437
Wagons and Carriages.....	1,144,215	862,493	2,720,463
Beer.....	2,283,400	991,560	2,329,572
Leather.....	914,700	1,301,821	1,923,898
Lead	758,650	536,522	1,019,962
Woolens.....	1,235,089	557,820	1,094,858

But even the above really magnificent totals for a state so young as Wisconsin, do not represent more than about half the amount of manufacturing actually done by us. The exact amount could not be reported were it certain that the figures actually returned were entirely accurate, for the reason that the census excludes all little shops, whose products fall short of \$500 per annum. Nevertheless the footings of the census are such as to awaken a feeling of pride in the breast of every citizen who has an interest in the general welfare.

The total value of our manufactures in 1860 was \$27,849,467. In 1868 we surprised not a few of even our most sanguine citizens by the estimate, in the report of that year that they had reached a total value of \$40,000,000. And yet but two years later we have the authority of the census bureau for the announcement of \$85,624,966, as the present actual total!

Assuming that it will be interesting to know the relative

progress of the several counties of the state in this department of industry, we present herewith :

TABLE showing the number of establishments, the number of hands employed, and the value of the products of the manufactories in each of the counties, in 1860 and 1870, respectively.

COUNTIES.	Number Establishments producing over \$500 worth.		Number of Hands.		Value of Product.	
	1860.	1870.	1860.	1870.	1860.	1870.
Adams	17	17	51	90	\$96,490	\$158,949
Ashland .....	.....	4	.....	33	.....	.....
Barron	15	.....	51	.....	42,512	.....
Bayfield .....	.....	4	.....	85	.....	21,000
Brown	13	197	58	1,928	66,800	2,159,392
Buffalo	13	103	45	194	88,200	466,045
Burnett .....	.....	.....	.....	.....	.....	.....
Calumet	21	72	68	169	50,000	130,684
Chippewa	8	89	338	1,000	297,500	1,345,113
Clark	8	31	38	118	37,100	109,048
Columbia	69	108	213	343	512,735	586,026
Crawford	14	44	83	143	107,857	240,548
Dane	108	144	494	414	1,010,944	1,121,563
Dodge	166	333	638	1,286	1,155,580	2,064,848
Door	41	75	137	393	81,175	428,969
Douglas	1	21	1	73	1,000	118,370
Dunn	6	72	344	170	199,175	1,027,593
Eau Claire	17	116	206	1,188	160,450	1,439,365
Fond du Lac	147	289	623	2,117	1,130,701	3,359,876
Grant	94	181	261	471	797,585	1,039,841
Green	115	200	261	544	855,950	1,081,300
Green Lake	28	141	138	405	105,250	723,265
Iowa	21	217	105	693	497,585	1,069,629
Jackson	15	24	166	280	133,030	365,650
Jefferson	112	267	377	1,284	765,966	2,298,027
Juneau	33	63	207	626	212,398	818,828
Kenosha	58	79	236	568	312,350	1,266,443
Kewaunee	10	38	182	379	547,100	361,057
La Crosse	68	84	340	851	435,450	1,149,501
La Fayette	22	122	77	382	245,832	677,513
Manitowoc	52	159	488	1,199	639,720	1,561,579
Marathon	20	42	276	420	269,040	672,960
Marquette	13	47	27	71	145,306	155,878
Milwaukee	558	822	3,406	6,946	6,659,070	18,838,783
Monroe	28	112	100	403	322,210	867,279
Oconto	25	62	838	1,521	491,676	2,085,901
Outagamie	25	85	153	795	486,483	2,529,222
Ozaukee	64	97	166	270	463,517	765,933
Pepin	16	32	124	137	135,741	185,515
Pierce	27	62	91	172	166,400	299,375
Polk .....	.....	9	.....	29	.....	54,890
Portage	20	92	106	408	113,540	522,942
Racine	132	133	803	1,478	1,312,763	3,174,825
Richland	39	69	84	164	155,909	310,566
Rock	101	300	496	1,384	1,968,761	3,395,781
St. Croix	3	119	4	226	21,000	796,518
Sauk	32	122	135	408	239,021	779,025
Shawano	1	11	2	92	2,500	290,785

TABLE showing the number of establishments, etc—continued.

COUNTIES.	Number Establishments producing over \$500 worth.		Number of Hands.		Value of Product.	
	1860.	1870.	1860.	1870.	1860.	1870.
Sheboygan.....	182	412	466	1,390	638,143	1,748,339
Trempealeau...	2	60	7	92	51,400	170,748
Vernon	43	84	94	184	173,076	470,765
Walworth	99	167	384	523	798,856	1,074,278
Washington ...	60	192	169	457	626,940	1,061,824
Waukesha.....	95	261	271	432	544,400	774,142
Waupaca	41	113	116	347	188,310	464,929
Waushara	24	55	55	95	149,487	260,897
Winnebago	91	237	511	2,634	966,818	6,312,754
Wood	31	45	299	623	172,000	370,890
Total	3,064	7,136	15,414	39,055	\$27,849,467	\$85,624,966

The *character* of the manufacturing establishments enumerated in the foregoing tables does not therein appear. And since it may be important to some, as it will doubtless be interesting to all of the readers of this report to know the extent to which the several counties are engaged in *specific branches* of manufacture, we have devoted several weeks of laborious effort to gleaning the statistics of such as are most important from the returns of the United States Census of 1870, deposited with the secretary of state, to whom we are indebted for the courtesy of granting their use. The tables containing the results of this labor will be found in appendix "B," at the end of this volume.

As we have often said before, nature seems to have designed Wisconsin to become the leading manufacturing state of the west, and the progress made within the past ten years affords the most gratifying evidence that she is rapidly advancing to the place of honor thus assigned her.

COMMERCE.

The commerce of the state has made progress corresponding with that of its productive industries.

All our efforts to procure full statistics of the business done by other cities than Milwaukee, having failed, we shall have to

content ourselves with the important data supplied by the Milwaukee Chamber of Commerce, to whose able and indefatigable secretary, Mr. W. J. Langson, we are indebted for the courtesy of advance sheets of the report for 1870.

On scanning this document, and making careful comparison of it with the annual report of the Board of Trade of Chicago for the same period, we have been highly gratified to see how bravely our own lesser metropolis has maintained its high rank as being *the leading primary wheat market of the world*.

It is also gratifying to note a steady growth in other branches of business; all indicating a new departure for our chief commercial metropolis, under the extraordinary development of its railroad system, of which a full account was given in our last report. Had the same practical wisdom, comprehensiveness of grasp, and vigorous action which now mark the course of Milwaukee in these regards been brought into effective use many years ago, much of the extraordinary effort now necessary to restore the traffic of the northwest to its natural and proper channels would have been saved.

The wheat movement, in which Milwaukee is more interested than in any other class of commercial transactions, is illustrated by the following table, in which comparison is also made between the receipts and shipments of Milwaukee and Chicago, which cities in this particular, however great the difference in other respects, are rival cities:

TABLE showing the Receipts and Shipments of Wheat at Milwaukee and Chicago during the past eleven years.

YEARS.	RECEIPTS.		SHIPMENTS.	
	Chicago.	Milwaukee.	Chicago.	Milwaukee.
1860	14,927,083	9,108,681	12,402,197	7,568,608
1861	17,385,002	15,930,706	15,835,953	13,300,495
1862	13,978,116	15,630,995	13,808,898	14,915,680
1863	11,408,161	13,485,419	10,793,295	12,837,620
1864	12,184,977	9,147,274	10,250,026	8,992,479
1865	9,266,410	12,043,659	7,614,887	10,479,777
1866	11,978,753	12,777,557	10,118,907	11,634,749
1867	13,695,244	12,523,464	10,557,123	9,598,452
1868	14,772,094	12,750,578	10,374,683	9,878,090
1869	16,876,760	17,745,258	13,244,249	14,272,799
1870	17,394,409	18,883,837	16,432,585	16,127,838

Thus it appears that in the total receipts of wheat during the year 1870, Milwaukee led Chicago by 1,489,428 bushels.

If, now, we compare the qualities and prices at these two great markets, we shall find that while the Milwaukee standard for No. 1 wheat is a little higher than at Chicago, the standard for No. 2 is a trifle higher at Chicago than at Milwaukee.

This higher standard for No. 1 spring at Milwaukee is doubtless due to the fact, that the spring wheat of Wisconsin, Minnesota and northern Iowa, which naturally seeks that market are usually of better quality than the average of such as naturally goes to Chicago. This establishes the superior credit of Milwaukee as a market for No. 1 wheat, and of course makes it an object for those who have No. 1 grain to send it to that place. Under these circumstances it is natural that Chicago should seek to establish a high standard for her No. 2 spring, which she has accordingly done, as will appear from the rules of inspection adopted by the two boards respectively.

On examining the tables of prices contained in the reports of the two boards, we find No. 2 spring wheat (the only grade reported at Chicago) quoted at the rates below :

RANGE OF PRICES of *Spring Wheat at Milwaukee and Chicago during 1870*

MONTHS.	No. 1. Milwaukee.	No. 2. Milwaukee.	No. 2.* Chicago.
January	\$0.81..@0.89 $\frac{1}{2}$	\$0.75 $\frac{3}{4}$ @0.84 $\frac{3}{4}$	\$0.77 $\frac{1}{4}$ @0.78 $\frac{1}{2}$
February	0.84..@0.88 $\frac{1}{2}$	0.79 $\frac{1}{4}$ @0.84..	0.80 $\frac{1}{4}$ @0.82..
March	0.84 $\frac{1}{2}$ @0.88 $\frac{1}{2}$	0.77 $\frac{1}{2}$ @0.82 $\frac{3}{4}$	0.77..@0.79 $\frac{3}{4}$
April	0.80..@0.96 $\frac{1}{2}$	0.73..@0.94 $\frac{1}{2}$	0.76 $\frac{1}{4}$ @0.78 $\frac{3}{4}$
May	0.90..@1.07 $\frac{3}{4}$	0.86 $\frac{1}{2}$ @1.04 $\frac{1}{4}$	0.87 $\frac{3}{4}$ @0.98 $\frac{1}{2}$
June.....	1.01..@1.28..	0.97..@1.25..	0.97..@1.22..
July	1.12..@1.40..	1.06 $\frac{1}{4}$ @1.35..	1.06..@1.22..
August	1.08..@1.33 $\frac{1}{2}$	0.99..@1.27..	1.10..@1.30..
September	0.98..@1.15 $\frac{1}{2}$	0.89..@1.13 $\frac{3}{4}$	0.95..@1.08..
October	1.00 $\frac{1}{4}$ @1.12 $\frac{1}{2}$	0.96 $\frac{3}{4}$ @1.10 $\frac{1}{2}$	0.90 $\frac{1}{2}$ @1.09 $\frac{1}{2}$
November.....	0.93 $\frac{1}{2}$ @1.14 $\frac{1}{2}$	0.92 $\frac{3}{4}$ @1.12 $\frac{1}{2}$	0.97 $\frac{1}{8}$ @1.06 $\frac{1}{2}$
December	1.04 $\frac{1}{2}$ @1.10 $\frac{1}{2}$	1.03..@1.08 $\frac{3}{4}$	1.03 $\frac{3}{4}$ @1.06..

Milwaukee leads Chicago therefore, not only in the quantity of wheat received, but also in the quality and prices thereof.

* Prices of No. 1 not quoted in report of Chicago Board of Trade.

For the benefit of our readers, so large a number of whom must be interested in knowing the rules of inspection which govern in the grading of grain of different kinds, we quote the rules now in force in Milwaukee and Chicago respectively.

Rules of the Milwaukee Chamber of Commerce.

SPRING WHEAT.

No. 1—SPRING WHEAT—Must be sound; well cleaned wheat, weighing not less than FIFTY-EIGHT pounds to the measured bushel.

No. 2—SPRING WHEAT—Must be sound; and weigh not less than FIFTY-FIVE pounds to the measured bushel, and must be free from grown or sprouted wheat.

No. 3—Shall comprise all wheat fit for warehousing, weighing not less than FIFTY-FOUR pounds to the measured bushel, which under the established rules for inspection may be unfit to go into the higher grades.

REJECTED—Shall comprise all wheat fit for warehousing, but too low in weight, or otherwise unfit to pass into *No. Three*.

(RICE WHEAT—No matter what quality, is invariably graded as *Rejected*.—SECRETARY.)

WINTER WHEAT.

WHITE WINTER—Must be choice white wheat, plump, sound and clean.

No. 1 WINTER—Red, or red and white mixed, clean and sound milling wheat.

No. 2 WINTER—Sound winter wheat, but of inferior grade.

REJECTED WINTER—Merchantable winter wheat inferior to *No. Two*.

COARSE GRAINS.

CORN—No. 1—To be sound, dry and well cleaned.

No. 2.—To include all other corn, dry, merchantable and reasonably clean.

REJECTED—All wet, very dirty, hot or otherwise badly damaged corn, and unfit for warehousing.

OATS—No. 1—To be sound, free from other grain, and well cleaned.

No. 2—All other oats, not unmerchantable.

REJECTED—All oats unsound or from any cause unmerchantable.

RYE—No. 1—To be sound and well cleaned.

No. 2—All rye not included in No. 1, that is not, in the judgment of the inspector unmerchantable.

REJECTED—All unsound rye that, from any cause, shall be deemed unmerchantable, and unfit for warehousing.

BARLEY—No. 1—To be plump, bright; clean, sound, and free from other grains.

No. 2—To be sound and reasonably clean.

REJECTED—All barley, that from any cause, is unsound or unmerchantable.

The inspector shall receive *fifteen cents* per car load for all grain inspected.

INSPECTION OF CARGOES.

The cost of inspecting cargoes of wheat out of the railroad elevators shall be *thirty* cents per thousand bushels, and out of all other elevators or warehouses *forty* cents per thousand bushels.

It shall be the duty of the inspector to give a certificate as to the quality of the grain so inspected, under the corporate seal of the Chamber of Commerce, the cost of inspection to be paid by the purchaser of the cargo inspected. No certificate of inspection shall be issued under the seal of the Chamber of Commerce unless such certificate covers the entire cargo.

Rules of the Chicago Board of Trade.

WINTER WHEAT.

NO. 1—WHITE WINTER—To be pure white winter wheat, sound, plump and well cleaned.

NO. 2—WHITE WINTER—To be pure white winter wheat, sound and reasonably clean.

NO. 1—RED WINTER—To be pure winter wheat, red, or red and white mixed, sound, plump and well cleaned.

NO. 2—RED WINTER—To be pure winter wheat, red, or red and white mixed, sound and reasonably clean.

AMBER WINTER, Nos. 1 and 2—Which shall include the lighter colored varieties of red wheat, quality and condition to be equal to the present standard of No. 1 and 2 red winter.

NO. 3—WINTER—To include winter wheat not clean or plump enough for No. 2, and weighing not less than 55 lbs.

REJECTED WINTER—All winter wheat damp, musty, or from any cause so badly damaged as to render it unfit for No. 3.

SPRING WHEAT.

NO. 1—SPRING—To be sound, plump and well cleaned.

NO. 2—SPRING—To be sound, reasonably clean, and weighing not less than 56 lbs to the measured bushel.

HARD—Spring wheat Nos. 1 and 2, which shall include the hard varieties of spring. Quality and condition to be equal to the present standard of Nos. 1 and 2 spring wheat.

NO. 3 SPRING—To be reasonably clean, not good enough for No. 2, weighing not less than 54 lbs.

REJECTED—All spring wheat, damp, musty, grown, badly bleached, or from any other cause unfit for No. 3.

In the case of mixture of spring and winter wheat, it will be called spring wheat, and graded according to the quality thereof.

Black Sea and flinty Fife wheat in no case will be inspected higher than No. 2, and rice wheat no higher than Rejected.

CORN.

WHITE—To be white, and in all other respects to be No. 1 corn.

YELLOW—To be yellow, and in all other respects to be No. 1 corn.

No. 1—To be sound, dry, plump and well cleaned, white or yellow.

No. 2 CORN—To be dry, reasonably clean but not plump enough for No. 1.

CORN—No. 2 kiln dried.

CORN—Rejected kiln dried.

REJECTED—All damp, dirty, or otherwise badly damaged.

OATS.

No. 1—To be white, sound, clean and reasonably free from other grain.

No. 2—To be sound, reasonably clean and reasonably free from other grain.

REJECTED—All damp, unsound, dirty, or from any cause unfit for No. 2.

RYE.

No. 1—To be sound, plump and well cleaned.

No. 2—To be sound, reasonably clean and reasonably free from other grains.

REJECTED—All damp, musty, dirty, or from any other cause unfit for No. 2.

BARLEY.

No. 1—To be plump, bright, sound, clean and free from other grain.

No. 2—To be reasonably clean and sound, but not bright or plump enough for No. 1, and reasonably free from other grain.

No. 3—To include shrunken or otherwise slightly damaged barley, not weighing less than 42 lbs to the measured bushel.

REJECTED—All barley, damp, musty or from any other cause badly damaged, or largely mixed with other grain.

All grain warm, or in a heating condition, will not be graded.

In the inspection of grain, the weight shall not alone determine the grade.

All inspectors must make their reasons for grading grain, when necessary, fully known by notations on their books.

All wheat is to be weighed, and the weight entered on inspection book.

The following recommendations have been adopted by the Board of Trade :

First—That all grain arriving in bulk be inspected and received into the house for such grade only as the inspector shall decide, except when sold on the track for grinding, city consumption, or shipment, and the Inspector shall in no case make the grade above the lowest quality found in any lot of grain, when it has evidently been mixed or "doctored," with the view of changing the grade; and that our warehousemen be requested to refuse all bagged grain, which shall have been bagged for this express purpose.

Second—That it be made the duty of all inspectors of grain to report to the inspection committee all attempts to defraud the inspection system. They shall report in writing every instance where warehousemen deliver or attempt to deliver grain of a lower grade than that called for by the warehouse receipt. They shall also report any and every attempt of a receiver or shipper of grain improperly to instruct or in any way influence the action or the opinion of the inspector, and also all other attempts to defraud the inspection system, and when the charges shall be sustained, it shall be the duty of the inspection committee to put the same on the bulletin board of the Exchange Room.

It shall be the duty of the chief inspector to keep a record of the weight of grain inspected into and out of each warehouse, which record shall be open to the inspection of any member of the Board during business hours.

The receipts and shipments of other kinds of grain and various other products at Milwaukee appear in the accompanying tables.

RECEIPTS AND SHIPMENTS of Grain other than Wheat, during the last eleven years, at Milwaukee.

YEARS.	RYE.		OATS.		BARLEY.		CORN.	
	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.
1860.....	32,382	9,735	178,963	64,682	159,795	28,056	126,404	37,203
1861.....	73,448	29,810	151,346	1,200	66,991	5,220	114,931	1,485
1862.....	154,476	126,301	282,756	79,094	149,997	44,900	258,954	9,489
1863.....	158,882	84,047	948,429	831,600	199,469	133,447	358,450	88,989
1864.....	88,541	.....	1,055,844	801,494	198,325	23,479	460,575	164,786
1865.....	134,360	51,444	667,492	326,422	149,443	29,597	270,754	71,203
1866.....	383,030	255,329	1,817,230	1,636,695	152,696	18,988	789,080	480,408
1867.....	237,303	106,795	1,156,319	622,469	192,007	30,822	693,684	266,249
1868.....	210,923	95,036	994,784	536,539	244,939	91,443	620,728	342,717
1869.....	203,804	120,662	722,949	351,768	247,499	78,035	487,564	93,806
1870.....	190,593	62,494	638,098	210,187	585,971	469,325	436,318	103,173

RECEIPTS AND SHIPMENTS of various Products of the Farm other than Grain, at Milwaukee since 1860.

Y'rs	Grass Seeds, Pounds.		Beans, Bushels.		Potatoes, Bushels.		Hops, Bales.		Cranberries, Barrels.		Wool, Pounds.		Butter—Pounds.		Fine Cattle.		Live Hogs.	
	Receipts	Ship.	Rec.	Ship.	Rec.	Ship.	Rec.	Ship.	Rec.	Ship.	Rec.	Ship.	Rec.	Ship.	Rec.	Ship.	Rec.	Ship.
1860	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	669,375	.....	889,025	814,316	.....	.....	.....	.....
1861	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000,225	.....	484,358	637,700	.....	.....	.....	.....
1862	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,314,210	.....	1,068,966	1,283,406	.....	.....	.....	.....
1863	.....	.....	7,808	11,813	.....	.....	.....	.....	.....	.....	1,355,379	.....	852,596	986,826	14,655	.....	56,826	.....
1864	.....	.....	6,123	10,091	62,007	94,197	.....	.....	.....	.....	1,993,372	.....	1,386,317	1,749,755	18,345	.....	42,250	.....
1865	.....	.....	6,160	9,699	39,460	84,844	3,000	.....	.....	.....	2,277,850	.....	1,200,381	1,263,740	14,230	.....	7,546	.....
1866	313,900	.....	9,181	10,716	111,167	101,830	5,801	.....	5,558	3,805	1,597,487	.....	1,711,217	1,318,318	12,955	.....	31,881	.....
1867	361,573	.....	5,542	5,948	69,453	20,039	26,562	23,700	2,518	2,170	2,085,006	.....	623,589	371,717	15,527	.....	76,758	.....
1868	578,008	.....	9,542	5,608	111,383	78,860	38,627	37,385	1,257	1,965	3,732,595	.....	1,408,155	623,882	13,200	.....	48,717	.....
1869	614,611	.....	9,923	5,062	19,236	8,154	41,025	41,794	7,763	4,473	2,501,666	.....	2,514,454	1,928,971	12,521	.....	58,296	.....
1870	320,690	.....	12,242	6,837	105,834	4,927	14,819	14,229	11,508	9,314	2,843,321	.....	3,779,114	3,075,715	12,972	.....	66,138	.....

The lumber trade of Milwaukee was heavier in 1870 than in 1869 and larger than ever before except in 1867 and 1868.

RECEIPTS AND SHIPMENTS of *Lumber during the past eleven years.*

YEARS.	LUMBER—FEET.		NUMBER SHINGLES.		LATH—FEET.	
	Receipts.	Shipments.	Receipts.	Shipments.	Receipts.	Shipments.
1860.....	30,124,000	.....	12,871,000	.....	2,889,000	.....
1861.....	56,504,000	.....	1,012,000	.....	2,823,000	.....
1862.....	38,858,000	.....	13,385,000	.....	3,950,000	.....
1863.....	30,158,000	.....	7,971,000	.....	1,373,000	.....
1864.....	35,548,000	.....	3,327,000	.....	2,038,000	.....
1865.....	42,056,000	.....	2,589,000	.....	3,535,000	.....
1866.....	58,899,000	21,906,156	19,585,000	10,703,000	4,790,000	1,238,125
1867.....	87,399,000	32,890,369	33,304,000	17,188,634	9,652,000	2,200,790
1868.....	94,023,000	30,788,608	20,980,000	16,407,800	9,972,000	2,077,680
1869.....	72,383,000	23,915,790	15,928,000	17,658,000	9,985,000	2,726,400
1870.....	79,491,000	19,289,506	15,143,000	17,939,800	3,747,000	1,893,735

The receipts of iron ore at Milwaukee, since the establishment of the Milwaukee Iron Company's works, are worthy of notice, as indicating the progress of that company's business :

Tons of Iron ore received at Milwaukee in 1868	2,590
....do....do.....do.....do.....do.....1869	7,024
....do....do.....do.....do.....do.....1870	112,060

The receipts of pig iron in 1870 were 11,903 ; amount manufactured at Milwaukee, 12,830 ; total, 24,733.

The shipments of pig iron from Milwaukee during the past five years have been as follows :

Total shipments in 1866, tons.....	4,445
.....do.....1867..do.....	4,103
.....do.....1868..do.....	6,361
.....do.....1869..do.....	4,672
.....do.....1870..do.....	8,216

Amount of railroad iron received in Milwaukee during 1870
28,553 tons.

The receipts of coal have increased since 1860 as shown below :

Tons of coal received at Milwaukee in 1861.....	31,608
....do.....do.....do.....do..... 1862.....	21,860
....do.....do.....do.....do..... 1863.....	43,215
....do.....do.....do.....do..... 1864.....	44,503
....do.....do.....do.....do..... 1865.....	36,369
....do.....do.....do.....do..... 1866.....	66,619
....do.....do.....do.....do..... 1867.....	74,568
....do.....do.....do.....do..... 1868.....	92,992
....do.....do.....do.....do..... 1869.....	87,690
....do.....do.....do.....do..... 1870.....	122,865

According to the reports of the various transportation companies, the amount of general eastern merchandise received in 1870, was 118,834 tons, exclusive of salt, plaster, pig iron and other coarse freight. The following are some of the most important:

Coffee, sacks	23,167
Sugar, barrels	78,273
Sugar, hogsheads.....	4,400
Tea, chests.....	13,883
Oil, barrels.....	30,924
Nails, kegs.....	97,497

The year 1870 was one of the most favorable for navigation ever known to lake Michigan. "The season," says the report of the Milwaukee Chamber of Commerce, "embraced almost seven and one half months of uninterrupted navigation. There was no serious interruption during the whole year." The amount of freightage by water was greater than at any former period.

The freight business done by the railroads of the state is illustrated by the accompanying tables :

TABLE showing the Amount of Business done by the Railroads of the State in 1865 and 1870.

Roads.	Length of Road in Miles.	Miles in Wisconsin.	Cost of Road.	Receipts.				Receipts in Wisconsin.
				From Passengers.	From Freight.	From other sources.	Gross Receipts.	
Chicago and Northwestern	1,186	285.57	\$49,776,957 72	\$3,519,904 47	\$8,568,348 49	\$115,096 24	12,203,409 20	2,087,487 19
Milwaukee and St. Paul	622	622	24,384,823 32	1,105,904 91	500,904 98	286,350 79	5,463,280 68	5,463,280 68
Mineral Point	82	82	1,200,000 00	18,591 16	87,803 50	.....	106,394 66	99,946 50
Sheboygan and Fond du Lac ..	45.50	45.50	2,000,933 62	28,250 72	40,893 37	16,862 07	86,006 16	86,006 16
Western Union	213	84	7,521,488 84	213,827 85	536,497 76	16,612 24	766,937 85	285,895 07
West Wisconsin*	115	115	4,600,000 00	.....	.....	.....	.....	.....
St. Croix and Lake Superior† ..	.....	.....	374,000 00	.....	.....	.....	.....	.....
Totals	2,263.50	1,234	\$89,858,203 50	\$49,246,599 11	\$9,794,508 10	\$434,921 34	18,626,028 55	8,022,615 60
THE SAME FOR 1865.								
Chicago and Northwestern	1,004.2	.....	\$42,101,202 93	\$2,751,009 71	599,136 35	222,558 48	8,109,049 52	1,928,562 40
Milwaukee and St. Paul	605	.....	17,323,149 44	1,369,075 08	3,426,203 33	38,171 06	4,833,449 47	4,807,772 61
Mineral Point	32.50	.....	75,000 00	14,654 50	34,632 32	2,678 81	49,286 82	46,253 78
Western Union (R. & M.)	68.75	.....	.....	104,834 27	520,711 23	.....	685,224 41	320,310 85
Sheboygan and Fond du Lac ..	20	.....	463,605 27	11,432 11	10,945 52	.....	22,397 63	22,397 63
Totals	1,712.45	.....	\$59,962,957 64	\$4,311,065 67	591,628 75	\$263,408 35	13,792,407 86	7,125,297 27

* Run by Milwaukee and St. Paul Company.

† Not running.

The following figures will show the increase in length and the relative amount of business done by our railroads in the past three years :

Number of miles of railroad in Wisconsin in 1868.....	1,042. 99
....do.....do.....do..... 1869.....	1,128. 21
....do.....do.....do..... 1870.....	1,234
<hr/>	
Gross receipts of roads in Wisconsin in 1868.....	\$7,851,714 56
....do....do.....do.....do..... 1869.....	8,277,035 83
....do.....do.....do.....do..... 1870.....	8,022,615 60
<hr/>	
Number bushels of wheat transported in 1868.....	23,533,913
....do.....do.....do.....do..... 1869.....	29,872,351
....do.....do.....do.....do..... 1870:.....	31,673,172
<hr/>	

INCREASE OF GENERAL COMMERCIAL FACILITIES.

We are not aware that there has been any material increase in the facilities for grain storage at the various leading markets on the lake shore during the year 1870. The aggregate capacity of the elevators at Milwaukee considerably exceeds three millions of bushels. With the facilities they afford about half a million bushels of grain can be handled in twenty-four hours.

Wharfage has been considerably improved at several points. Of Milwaukee in particular, the secretary of the Chamber of Commerce speaks in the following terms :

“Considerable progress has been made on the interior improvements of our harbor, in the extension of dock lines and opening new channels, particularly with reference to the handling of iron, lumber, coal and other heavy commodities, but there is still room for improvement to any possible extent that the future commerce of the city may require, the advantages of the harbor of Milwaukee in this respect are unsurpassed.

“Number of vessels belonging to the port of Milwaukee, in 1870, 243; tonnage, 38,494.”

The progress of the State in railroad improvements has been no less marked during the past than during the previous year.

The Chicago and Northwestern Railway Company has made considerable progress in the construction of a line between Madison and Baraboo, to be ultimately, and it is supposed at an early day, extended thence to Tomah, for connection with the West Wisconsin Railroad; thus making a very direct line between Chicago and Saint Paul.

Iowa and Minnesota Division—

McGregor to St. Paul.....	212	
Mendota Junction to Minneapolis.....	9	
Conover to Decorah.....	10	
	<hr/>	231

Iowa and Dacotah Division—

Calmar to Algoma.....	126	
Austin to Mason City.....	40	
	<hr/>	166

La Crosse Division—

Milwaukee to La Crosse.....	196	
Watertown to Madison.....	37	
	<hr/>	233

Northern Division—

Milwaukee to Berlin.....	94	
Rush Lake to Winneconne.....	15	
Horicon to Portage City.....	44	
	<hr/>	153

Total miles road owned by M. & St. Paul Railway Co..... 1,018

Additional Roads operated by the Milwaukee and St. Paul Railway Co.—

West Wisconsin Railroad; Tomah to Menomonee.....	111	
St. Paul and Chicago.....	61	
Hastings and Dakota Railroad.....	22	
Milwaukee and Northern Railroad.....	20	
	<hr/>	

Total miles of road operated by Mil. & St. Paul R'y Co 1,232
 Western Union Railroad and Iowa extension..... 234

Total length of railroads from westward running into Mil.. 1,466

Direct Tributaries—

Southern Minnesota Railroad—La Crosse to Winnebago City....	170	
Winona and St. Peter R. R—Winona to Mankato and St. Peter..	144	
St. Paul and Pacific Railroad—St. Paul to Willmar.....	105	
....do.....do.....St. Paul to Sauk Rapids.....	76	
St. Paul and Sioux City Railroad—St. Paul to St. James.....	122	
Lake Superior and Mississippi Railroad—St. Paul to Duluth....	156	
	<hr/>	

Total length of Milwaukee railroads and western tributaries. 2,239

“Of the above roads upwards of eighteen hundred miles are operated in the interests of Milwaukee. The Winona and St. Peter Railroad alone is controlled by the Chicago and Northwestern Railway, but as it has no outlet save over the lines of the Milwaukee and St. Paul Railway, it is necessarily tributary to same extent to Milwaukee. The St. Paul and Sioux City and the Lake Superior and Mississippi railroads are understood to be controlled in the interest of Duluth, but their management is in no degree hostile to Milwaukee, and as the region through which they run becomes developed, they will inevitably contribute largely to the business of the roads terminating in this city.

“The Milwaukee and St. Paul Railway Company, have during the past year extended their Dacotah Division to Algoma, 40 miles beyond the terminus of a year ago, a point 362 miles on a nearly direct line westward from Milwaukee, and also built a branch line of 40 miles in length, between Austin and Mason City. The latter was built more especially to meet the wants

of the lumber trade of Minneapolis, and furnish a convenient outlet, for the coal fields of Iowa. This Division penetrates a region of unsurpassed fertility, the resources of which are yet comparatively undeveloped. It is understood that its further extension will not be continued during the present season, the company probably desiring to apply their energies in other directions.

"The same enterprising capitalists have also during the past year built 41 miles of road along the river, between St. Paul and Winona. Sixty-one miles of this road are now in operation, and the remaining 43 miles to complete the line from St. Paul to Winona are under contract to be completed before the 1st of September. It is yet undetermined whether the Company will build a new line from Winona to La Crosse on the west side of the river, or make arrangements with the Winona and St. Peter Company to run over the same track from Winona to the Junction with the La Crosse road. The importance of this road will be appreciated when it is understood that its completion will shorten the distance between Milwaukee and St. Paul about *eighty miles*.

"It is announced, upon apparently good authority, that arrangements have been consummated which secure the building the present season of the main line of the St. Paul and Pacific Railroad through to Breckenridge on the Red river, and also the construction of the branch line from Sauk Rapids via. Crow Wing to a junction with the Northern Pacific at or near Otter Tail lake. The extension of these roads greatly enhances the importance of the River road, inasmuch as it insures a direct and early connection with the Northern Pacific; and it is greatly to the advantage of our city that this road is in the hands of a Milwaukee corporation. Its legal name is the "St. Paul and Chicago Railroad," though better known as the "River Road." In connection with the La Crosse Division of the Milwaukee and St. Paul Railway, it will doubtless become the principal avenue of travel between the Northern Pacific Railway and the east, and the numerous flourishing towns along its line from La Crosse to St. Paul insure it a valuable local traffic.

"It is evident that the Milwaukee and St. Paul Railway company appreciate the importance of securing the most direct connections with the Northern Pacific Railroad over their lines, and in addition to the roads already built and under construction, they have decided to build an air line road from Berlin, the present terminus of their Northern Division, direct to Superior and Duluth, thus securing the shortest possible connection with the Northern Pacific at its eastern terminus. The company will apply to Congress at the next session for the necessary legislation to carry out this great enterprise.

"The West Wisconsin Railroad, an important tributary to Milwaukee, was extended 45 miles during 1870, and is now in operation to Menomonee, 111 miles from Tomah, its junction with the St. Paul road. It will probably be completed to the St. Croix river before the close of another season.

“Great progress has been made in the building of the Southern Minnesota Railroad. The link between the eastern and western divisions has been finished, and the road extended to Winnebago, 170 miles west of La Crosse, its eastern terminus. It is the intention to ultimately extend this road to the Missouri river. During the past winter it has been connected with the Milwaukee and St. Paul Railway by a temporary bridge across the Mississippi at La Crosse. A permanent bridge at this point is in contemplation. At Winona a substantial bridge is in process of construction.

“The connecting link, from Eagle to Elkhorn, between the Prairie du Chien and Western Union roads having been completed early in the season, trains have since been running daily from Milwaukee to Rock Island, and the recent completion of the Rockford, Rock Island and St. Louis Railroad has given us the benefit of a new route to St. Louis. Our merchants are now daily shipping produce and merchandise over this route to St. Louis and other Southern markets. The extension of the Western Union Railroad from Savanna, the point where it first touches the Mississippi, across the richest and most populous portion of the State of Iowa, has been provided for, with the assistance of the capitalists interested in the Western Union since it became a Milwaukee road, and the construction of the new line is vigorously progressing. Twenty miles have recently been completed and put in operation. The extension is known as the Sabula, Ackley and Decotah Railroad.

“Not least important to Milwaukee among the railroad enterprises which have marked the past year as an eventful era in the progress of our city and state, is the commencement of the Milwaukee and Northern Railroad, running mid-way between Lake Michigan and Lake Winnebago from Milwaukee to the upper Fox river, and thence in a northwesterly direction towards Duluth, with a branch line to Green Bay, and eventually to Lake Superior. The first twenty miles of this road are now in successful operation, and with proper guarantee of the promised aid from this city and other places along the line, will be extended to the intersection of the Sheboygan and Fond du Lac Railroad during the present season, thus opening more direct communication between the two last named cities and Milwaukee, and before the close of 1871 will be pushed on to the Fox river. It is a noteworthy fact that the first twenty miles of this road have been built and put in operation without any foreign aid whatever. The company's first mortgage bonds are now for the first time placed on the market, and are offered to a limited amount at ninety cents. The line of this road, at least as far as the Fox river, is densely populated, extremely fertile, and abounds in valuable water powers, and the best of timber. It has been pronounced by competent authority equal to the best railroad route in the state. Its progress should be regarded with special satisfaction by Milwaukee as being the only successful effort for many years to recover to our city the long lost trade of northern and eastern Wisconsin, forced over a wide circuit *around* us by the Chicago and Northwestern road. Its completion will greatly shorten the dis-

tance between Green Bay and Milwaukee and Chicago, and will surely turn the tide of travel to and from northwestern Wisconsin and Lake Superior through our city.

“An air line railroad from Milwaukee to Fond du Lac is still a cherished project with many of the leading citizens of both cities, and some steps have recently been taken to initiate the enterprise, but in the absence of its accomplishment, the northern road, as soon as it reaches Plymouth, will relieve Fond du Lac to some extent from the unreasonable exactions of the Chicago and Northwestern road.

“The subject of adequate eastern outlets for the great lines of railroad terminating at this city has for some time occupied the attention of the directors of the Milwaukee and St. Paul Railway, and in view of continually increasing length of their roads, it is announced that they have decided to build an additional road from this city to Chicago, and have obtained the necessary legislation to carry out this enterprise. Should the pending negotiations result in the purchase by them of the existing road, it is understood that they will give the great trunk lines of the east an opportunity of running through passenger trains from the seaboard cities directly to Milwaukee upon such terms as to insure this result. In order to improve the winter outlet for freight across the lake, via the Detroit and Milwaukee Railroad, the managers of the Milwaukee and St. Paul Railway, in connection with the lake transit interest, have recently built a transfer grain elevator of 50,000 bushels storage capacity at Grand Haven. This is an improvement that has been greatly needed, and it will be appreciated by our grain shippers and eastern millers and dealers who may want our grain during the winter season, and will thus be able to get it without having to pay tribute to Chicago.

“The development of the numerous railroad enterprises in progress on the eastern side of Lake Michigan, promise some advantage to Milwaukee in multiplying the lines of communication with the east and west. The piece of road lately built from Allegan to Muskegon establishes a very direct line from Grand Haven to Fort Wayne and Pittsburg, and is likely to become a branch of the great Pennsylvania Central line, in which case it will become a formidable competitor with the Detroit and Milwaukee road for both freight and passenger traffic through this city.

“The Michigan Central has acquired control of the Grand River Valley Railroad, and extended it from Grand Rapids on a parallel line with the Detroit and Milwaukee Railroad to Ferrysburg, near Grand Haven, and thence to Muskegon and Whitehall, on the lake shore, north of Grand Haven. The distance from Milwaukee to Muskegon, across the lake, is just 84 miles. About half of the projected link of road between Port Huron and Owosso has been built, and the remaining portion is under contract to be built the coming season, thus completing a perfect air line route from Milwaukee to Suspension Bridge.

“In every view of the situation, the prospects of Milwaukee were never

before so promising of a prosperous future, so far as railroad enterprises can effect our prosperity, and at this day it will be generally admitted that there is no other influence so potent in building up a city as that of railroads.”

The Fox and Wisconsin River Improvement, whose claims were set forth at considerable length in our last report, has finally—thanks to your own intelligent and vigorous action and the concurrent action of numerous other citizens, including our able senators and members of congress—been fairly inaugurated. The large amount of money desired, and which would be necessary to the construction of permanent improvements insuring the navigability of the Wisconsin river at all stages of water, has not yet been granted; but the government, at the last session of congress appropriated \$100,000, as you are so well aware, for the commencement of the work, and has appointed Colonel Houston, of Chicago, engineer in charge of lake improvements, etc., to expend the money in such dredging, surveying and other practical operations as will render the river navigable during ordinarily favorable conditions.

The government has also taken steps to acquire the ownership and control of the improvements already made by the Green Bay and Mississippi Canal Company. To this end it has been provided by Congress that a board of arbitrators, consisting of three members—one to be appointed by the government, one by the company, and the third by these two—shall examine into the condition of said improvements, their cash value, and report at an early day.

The government has appointed Wm. W. Larabee, of Iowa; the company, Hon. J. R. Doolittle; and as soon as the third member shall have been agreed upon by these two, the board will begin its investigations.

These several important steps are a pledge of the interest taken in this much needed improvement by the country at large, and are an earnest of what may be expected of the government in an early future.

RECENT STATE LEGISLATION IN THE INTEREST OF INDUSTRY.

There is but little to record under this head beyond what was mentioned in our last report, except the passage of a new law by the present legislature "to protect and encourage the raising of sheep, and discourage the raising of dogs," and the adoption of amendments to the general "act for the formation and protection of county agricultural societies," and the law of 1868, entitled "an act to encourage the planting and growing of trees, and for the protection thereof."

We note with pleasure the growing appreciation of the industrial interests of the state, and a disposition on the part of the legislature to give such encouragement to them as seems necessary to their advancement.

IMMIGRATION

Has taken a step forward. Wisconsin has slept upon her oars quite too long, and it is well that more adequate provision has at last been made for insuring to us our full share of the old world's population coming in such multitudes to the American shores.

Our natural advantages, as a state, of themselves attract large numbers of immigrants; but when the competition is so general, and in several of the neighboring states so active, it is highly important that the most systematic and efficient measures should be used. The state has done well therefore to create the office of commissioner of immigration, whose whole time and energies, with such assistance as he may require, shall be given to the work, first of interesting immigrants in this portion of the country, and, secondly, of providing them with such information and direction on their arrival as will help them in securing desirable and permanent homes among us. Such service intelligently and faithfully rendered cannot fail of important results.

COUNTY AGRICULTURAL SOCIETIES AND OTHER INDUSTRIAL ASSOCIATIONS.

It is gratifying to observe a gaining activity on the part of the county agricultural societies. It seemed difficult at the close of the war, for some of them to rally and resume their labors with the old spirit and enthusiasm. Even yet we are scarcely up to the mark of 1860 in point of numbers; for there were then thirty-seven county societies in operation and holding exhibitions, whereas there are now but thirty-six.

Besides these thirty-six county societies, however, we have a number of flourishing independent societies, embracing either portions of a county, adjoining portions of two or more counties, or several neighboring counties. So that the total number of industrial societies of various kinds has really made a little increase. Moreover the condition of the societies in operation is greatly improved, as will appear from the comparisons made in the table below :

	1860.	1870.
Total amount of annual receipts of county societies	\$17,664 29	\$53,353 14
Total expenditures of county societies.....	16,548 01	50,969 21
Total amount paid in premiums.....	6,997 10	19,613 53
Total amount in their several treasuries	1,356 06	6,228 91
Total amount of indebtedness	162 46	989 68

Such important facts as could be gleaned from the official reports of county societies are concisely presented in the following table.:

COUNTIES.	REPRESENTATIVE OFFICERS.			PLACE AND DATE OF FAIR.		FINANCES.			
	Presidents.	Secretaries.	Treasurers.	Place.	Time.	Receipts.	Expenses.	Premiums.	Am't in Treas'y.
Adams.....	A. Rood	J. M. Higby.....	J. W. Horton	Plainville.....	Sept. 27-28	\$312 00	\$285 75	\$214 75	\$46 25
Ashland.....									
Barron.....									
Bayfield.....									
Brown	J. G. Lawton.....	M. P. Lindsley.....	D. Butler	Green Bay	Sept. 30	1,543 63	224 30	134 60	1,319 33
Buffalo.....									
Burnett.....									
Calumet.....									
Chippewa.....									
Clark.....									
Columbia.....	F. C. Curtis.....	L. H. Doyle.....	J. Q. Adams.....	Portage	Sept. 21-23	912 91	867 75	613 00	289 00
Crawford	Joseph Atherton.....	J. R. Brunson.....	Lawrence Case	Prairie du Chien.....	Sept. 21-23	986 70	846 63	326 20	140 07
Dane.....	Wm. R. Taylor	G. C. Russell.....	George A. Mason	Madison	Sept. 20-22	2,111 09	2,095 94	1,057 15	15 15
Dodge	Alfred Farlow	E. B. Bolens	O. B. Wilcox.....	Juneau	Sept. 13-15	400 00	390 05	143 00	9 95
Door.....	George Pinney.....	J. Kember	R. M. Wright	Sturgeon Bay	Oct. 4-5	200 00	151 40	84 00	48 60
Douglas.....									
Dunn.....									
Eau Claire.....	R. E. Seott.....	Harris Searl	Charles Buckman.....	Angusta	Oct. 18-19	373 00	373 00		*170 29
Fond du Lac.....	E. S. Hammond.....	D. C. Lamb	A. B. Taylor	Fond du Lac.....	Sept. 13-15	2,484 96	2,446 86	1,064 40	99 33
Grant.....		T. A. Burr	W. W. Robe	Lancaster.....	Sept. 14-16	1,823 83	1,691 69	977 75	132 14
Green.....	H. W. Whitney	Wm. W. Wright	A. L. Cleveland.....	Monroe	Sept. 15-17	1,009 16	1,005 88	472 50	3 28
Green Lake.....	W. S. Flint	L. C. Potter.....	Scott Rogers.....	Princeton.....	Sept. 15-16	549 90	549 90	464 90	
Iowa.....	John Ellwood	J. T. Pryor, Jr.	Samuel Hoskins.....	Dodgeville.....	Oct. 5-7	2,365 25	2,078 40	1,005 00	286 85
Jackson.....									
Jefferson.....	Q. B. Olin	Jackson Jones.....	Solon Brown.....	Jefferson	Sept. 20-22	1,302 45	1,001 35	522 50	301 10
Juneau	F. Langworthy	I. G. Parker	M. Temple.....	Mauston	Sept. 21-22	617 25	565 68	356 70	51 57
Kenosha.....	H. A. Newbury	H. H. Tarbell.....	Edward Jones	Kenosha	Sept. 20-22	1,719 63	1,373 27	676 00	346 36
Kewaunee.....									
La Crosse.....	C. C. Palmer.....	A. J. Phillips.....	V. M. Adams	Salem	Sept. 21-23	900 70	840 00	405 00	60 70
La Fayette.....	F. Campbell	W. L. Abbott	S. S. Allen.....	Darlington.....	Sept. 16-17	1,132 11	1,121 46	950 62	10 65
Lodi UNION.....	J. Narraeong.....	I. Van Ness.....	J. B. Dwinnell.....	Lodi	Sept. 14-16	988 93	885 22	431 00	149 63
Manitowoc.....	D. J. Easton	A. Piening.....	John Hall	Manitowoc	Sept. 21-23	529 38	524 69	170 09	4 69
Marathon	B. G. Plumer.....	Valentine Ringle.....	C. Hoeflinger	Wausau	Sept. 20-21	584 00	429 97	226 25	155 04

* Indebtedness.

Abstract of returns of County Agricultural Societies for 1870—continued.

COUNTIES.	REPRESENTATIVE OFFICERS.			PLACE AND DATE OF FAIR.		FINANCES.			
	Presidents.	Secretaries.	Treasurers.	Place.	Time.	Receipts.	Expenses.	Premiums.	Am't in Treas'y.
Marquette.....	James Graham.....	G. W. Robinson.....	Geo. McKey.....	Montello.....	Sept. 21-22	\$205 25	\$222 94	\$144 00	\$37 06
Milwaukee.....	J. A. Clark.....	D. McBride.....	T. B. Tyler.....	Sparta.....	Sept. 15-17	775 00	688 98	288 98	87 66
Monroe.....	A. M. Skeels.....	I. H. Hicks.....	James H. Jones.....	Oshkosh.....	Oct. 3-8	4,552 38	3,725 63	1,593 15	826 75
NORTHERN WIS.									
Oconto.....	L. C. Patterson.....	W. H. Lamphear.....	F. C. Goff.....	Appleton.....	Sept. 15-17	624 30	433 35	164 25	250 34
Ozaukee.....	A. M. Alling.....	Wm. Vogenitz.....	B. O. Zastro Kussow.....	Cedarburg.....	Oct. 5-6	392 65	392 65	172 75	19 94
Pepin.....	J. M. Bailey.....	J. H. Southwick.....	M. W. Barb.....	Prescott.....	Oct. 7-8	243 50	333 60	225 00	7 68
Pierce.....	M. Strope.....	J. H. Felch.....	Wm. Calkins.....	Plover.....	Sept. 23-24	103 00	82 25	77 25	20 75
Portage.....	N. D. Fratt.....	A. L. Lawton.....	J. Lueck.....	Burlington.....	Sept. 14-16	2,596 85	2,391 26	1,505 00	722 49
Racine.....	J. B. McGrew.....	Wm. H. Joslin.....	C. H. Smith.....	Richland Center.....	Sept. 22-23	578 95	576 38	144 00	2 57
Rock.....	Seth Fisher.....	R. J. Richardson.....	A. Hoskins.....	Janesville.....	Sept. 21-24	9,063 25	10,865 02	1,585 83	86 60
St. Croix.....	H. H. Potter.....	J. J. Gatteker.....	Henry Cowles.....	Baraboo.....	Oct. 6-7	1,904 59	1,904 59	304 00	*779 39
Sauk.....	D. W. Gilbert.....	J. E. Thomas.....	M. D. Hotchkiss.....	Sheboygan Falls.....	Sept. 13-15	1,403 26	1,403 26	460 50	.....
Shawano.....	D. Bunn.....	A. R. Wymann.....	R. A. Odell.....	Trempealeau.....	Oct. 5-6	456 34	406 15	207 00	50 19
Trempealeau.....	C. P. Tracy.....	Geo. W. Nuzum.....	Ralph Hall.....	Viroqua.....	Oct. 5-7	611 75	594 37	289 75	424 38
Vernon.....	P. G. Harrington.....	S. G. West.....	H. Latham.....	Elkhorn.....	Oct. 5-6	3,335 44	3,588 13	1,064 00	.....
Walworth.....	F. W. Nolting.....	A. Semler.....	Franz Lorenz.....	West Bend.....	Oct. 6-8	818 35	681 62	324 75	136 73
Washington.....	W. D. Bacon.....	W. V. Tichenor.....	O. M. Tyler.....	Waukesha.....	Sept. 14-17	2,841 40	2,949 84	768 00	106 08
Waukesha.....									
Waupaca.....									
Washara.....									
Winnebago.....									
Wood.....									
Total.....						\$53,353 14	\$50,969 21	\$19,613 53	\$6,228 91

Thirty-eight reporting. Twenty-one not reporting.

*Indebtedness.

† See Northern Wisconsin above.

There can be no question of the great value of the work done by these societies in their respective localities. Improved cultivation, better stock, fruits and implements follow as the result of their labors, and thus add to the general worth and prosperity of the state. The policy of the state in granting them pecuniary aid is most judicious and should on no account be discontinued. It is more than probable that the amount annually expended for their encouragement might even be increased with advantage.

Several of the states deal with like associations much more liberally than we do ; some of them—as Massachusetts, for example, which appropriates \$600 to each county, instead of \$100—giving them sums amounting to several hundred dollars per annum, while at the same time either wholly supporting, or generously contributing to, their state boards or societies.

Besides the county societies, there have sprung up—one of them last season—three agricultural and mechanical associations, to-wit : in the northeastern, southern and southwestern portions of the state, each embracing several counties and holding what many termed *district* fairs. They are designed to supplement, not to supersede the work of the county societies, by giving extra stimulation and encouragement to the industry of these general divisions of the state, and as best they can, to meet such wants as cannot be supplied by the state society. Reports of one or two of these are herewith submitted.

Efforts to organize and keep up *town clubs* have also proved very successful of late. As a means of awakening interest among the farmers and mechanics of a given locality and of diffusing valuable practical information among them by means of essays, discussions, and libraries, these organizations are of very great value. As an example of what some of these clubs are doing and by way of encouraging others to make annual reports to this office we shall also submit the proceedings of one or two of them for publication herewith.

Local horticultural societies are entitled to like commendation. Those of Kenosha, Oshkosh, Janesville and Madison,

and those of Richland and Sheboygan counties are especially successful, doing much good in their several localities, and, by the experiments and reports of their members, adding to the common stock of horticultural knowledge.

THE UNIVERSITY AGRICULTURAL DEPARTMENT.

In despite of the embarrassments which necessarily attend the inauguration of such a work as it purposes, and with very limited means, is still gaining ground. Until it is better equipped and supplied with a full corps of instructors, the public should be very moderate in their demands upon it.

By favor of W. W. Daniells, B. S., Professor of Agriculture, etc., we are enabled to publish a pretty full report of the present condition, plans and needs of the department.

THE WISCONSIN ACADEMY OF SCIENCES, ARTS AND LETTERS.

The organization of this institution within the year, of which this report is the industrial record, the great importance of the work it has undertaken to perform, and the intimate relation, which by reason of the character of the work, it must sustain to the State Agricultural Society,—these circumstances are not only sufficient warrant for a notice of it in this connection, but also for including in its appropriate place a condensed summary of such of the Academy's proceedings as shall be deemed of interest and value to the industrial public.

The first thing done by an intelligent man who would set himself up in business is to make a reckoning of his resources. Should he know absolutely that they are vast, while the new demand to be made upon them will for a time be limited, he may defer a very close calculation for a time. But as his business enlarges and competition increases, he naturally desires to know definitely what he has, and to make all dormant capital available.

This is also the necessity of the state. And the recognition of such necessity is what first originated geological and general scientific surveys of countries and individual states, whose

real interest it is to institute them early, and continue them steadily, until complete knowledge is gained of their material resources in every department.

It is clearly the bounden duty of every government to do what it can, both directly and indirectly, to promote the applications of science and art to the various practical industries. Is it any less its duty to do all it can for the advancement of science itself, to which, however abstract and useless its determinations may at first appear, we must finally trace all those inventions, discoveries and improvements which have lifted the race of men from the depths and darkness of barbarism and placed it on the high road to a true civilization?

There are two ways in which enlightened governments are accustomed to seek the accomplishment of their ends: first, by the direct employment of competent men to perform the various duties definitely assigned them; secondly, by granting moral encouragement and pecuniary aid to associations of men whose love of original researches and investigations leads them into such labors. Sometimes both these methods are employed at once. In other cases the means of government are almost wholly confined to one. But there is no enlightened country, and in this country no enlightened state, advanced beyond the stage of very infancy, in which such associations—usually known by the name of *academy* or *society*—do not exist, or which does not in some way extend to them a fostering care.

The Wisconsin Academy was organized and is to be managed in the common interest of the sciences, the practical and fine arts, and of literary culture and research. A leading object is the making of such explorations in all parts of the state as will bring to the knowledge of the public the location, extent and value of its various metallic ores, quarries, and useful minerals of any sort, as well as the character of its soils, timber, etc., its climatic peculiarities, and whatever else may have any important relation to its growth in material prosperity.

The membership already embraces a large number of those citizens who, in various ways, have contributed most to the knowledge we already have of the resources of our state. It also includes many gentlemen eminent for their services in the promotion of the useful arts, together with a considerable number no less distinguished in the world of letters.

The meetings hitherto held for the reading of original papers and for the discussion of important questions have been highly successful, and there is every reason to hope that the institution will meet the expectation of its friends and accomplish great good in the state.

With a view of establishing a relation of practical intimacy between the two institutions, the constitution of this society was so amended at the last annual meeting as to make the president and general secretary of the academy members *ex-officio* of the executive board of the society. Resolutions were also adopted tendering the academy the cordial sympathies of the society and the joint use of the apartment at present occupied by the society's collections.

THE CONDITION OF THE STATE AGRICULTURAL SOCIETY

Was never so prosperous as now. The renewal of its annual publications has awakened new interest, and its influence for good seems to be more widely and universally felt.

The great pecuniary success of the last exhibition not only relieved the society of all embarrassment, but also enabled it to make what was considered a very important investment in real estate, and still report a considerable balance in the treasury.

The real estate referred to consists of the well-known and beautiful state fair grounds of Madison, being a fraction over fifty-three acres; which entire tract, carrying a perpetual lease of the improvements thereon, was purchased for \$6,000.

A contract for this property was made by the president and secretary soon after the exhibition of 1869, when no other locality was certainly available for subsequent exhibitions, and

when, but for such contract the society was sure to lose all further use of the said grounds, since the estate to which they belonged had been put upon the market and was bound to be sold.

As a detailed account of the transaction will be found in the official proceedings of the annual meeting, herewith presented, no further statement need be made in this connection.

The state fair of 1870 was a most decided success as an *exhibition*. No department was deficient, and some of them, especially the departments of manufactures and fine arts far excelled anything of the past. The facilities for getting to and from the grounds gave excellent satisfaction, as did likewise the railroad facilities for getting to and from Milwaukee. The thousands who attended found comfortable accommodations in the city at fair prices, and good feeling and satisfaction seemed to prevail universally.

Had the entries been reckoned as much in detail as is usual with many other societies, the number would have considerably exceeded three thousand; as it was they reached two thousand and ninety-seven.

The report of the treasurer, herewith submitted (and published under the head of "proceedings") shows the total receipts in money to have been \$23,495.23; the expenditures, \$9,717.77; the amount awarded in cash premiums, \$5,378.05.

Addresses eloquent and practical were delivered by the Honorable Horatio Seymour of New York, His Excellency Governor Austin of Minnesota, His Excellency Governor Fairchild, and Charles Seymour, Esq., editor of the *La Crosse Republican*.

The number of life members added during the past year is 108; making the present total number 672. And since each member is entitled by the terms of the constitution, and very properly so, to a copy of the society's Transactions, we are led in this connection to ask the attention of the state to the propriety of increasing the number of copies of this document annually published.

The edition was fixed at 3,000 twenty years ago, and has not been changed from that day to this, although the demand has of necessity greatly increased, both at home and abroad.

With the present edition, and the present law regulating the distribution, the society is immediately upon publication so far reduced in its very limited supply that the secretary is obliged to deny hundreds of calls whose source and nature are such as to properly demand a more favorable response. Of volumes nearly twice as voluminous and expensive, Illinois regularly prints 10,000; Massachusetts, New York and Ohio 10,000 to 30,000 copies. It would not become this society to make comparisons of its own reports with those of any other societies or boards of agriculture; but there can be no impropriety in the statement that if its transactions are worthy of being published at all, it would be economy for the state to distribute them more widely than at present.

In bringing this quite lengthy report to a conclusion, we cannot forbear the expression in general terms, of the high degree of pleasure we have derived from the retrospect of the past ten years. True, we have found occasion to note many deficiencies and positive errors, in both policy and in practice; and yet, as a whole, the record is one of which we may be proud. For we must not forget what these years have embraced.

We said "must not forget," and yet is not every man's consciousness proof that it is impossible to realize, even when we attempt to recall them, the terrible experiences of the first full half of that dark and trying period? A period during which nearly one-fifth of the entire population were wrested from the peaceful pursuits of a rapidly growing productive industry, and converted into armies destined for conflicts among the most fierce and destructive known to modern times—a period too, of government exactions which have put every nerve and fiber to the strain as a means, first, of victory, and then of saving the nation from financial ruin.

Is not this a marvel of national history—that a war which sacrificed myriads of lives and billions of treasure, should have left so few traces upon vast areas of the empire, indeed that within five years after its close, the slightly increased demands of the tax-gatherer, and the recurring anniversaries and reunions of those who participated in its memorable achievements,

are almost the only reminders to the great body of the people that the long reign of peace which followed the war of 1812, has been disturbed in all our borders?

What better evidence could be given of the vastness of our material resources and the mighty energies of our people.

The people of Wisconsin have a richer inheritance than even the most thoughtful and best impressed are able to realize. A healthful climate; scenery which for beauty and variety is unsurpassed by any equal area on the globe; soils variously adapted and of great fertility; forests of timber whose extent is almost without parallel on the continent, and whose market is the empire of the west; exhaustless supplies of the most essential minerals; quarries, water-powers without rival; and natural commercial facilities which are the envy of her sister states;—all these and more are hers by the gift of God.

To these there has been added by this first generation of inheritors more than a thousand cities and villages, embracing with the country dwellings, nearly two hundred thousand houses; permanent agricultural improvements valued at nearly three hundred millions of dollars, besides stock and implements worth over one hundred and fifty millions; more than seven thousand manufacturies, representing a capital of some fifty millions of dollars; over a thousand miles of railway; a tonnage of some hundreds of thousands of tons of shipping; to say nothing of the countless number of other improvements that cannot be enumerated here, and which, aggregate a value amounting to scores of millions of money. A magnificent accomplishment indeed for the pioneer generation, results all the more astonishing because they have come in large measure as they would, independent of any system of development or well-formed plan of operations on the part of the state.

Now let us have a comprehensive, far-seeing statesmanship for the guidance of the public affairs, and we shall see how far it is possible for the next ten years to transcend the past.

On behalf of the Executive Board,

Your obedient servant,

J. W. HOYT, *Secretary.*

STATE AGRICULTURAL ROOMS, Madison, March, 1871.

PROCEEDINGS.

EXECUTIVE MEETINGS.

STATE AGRICULTURAL ROOMS,

MADISON, Feb. 1, 1870.

The executive board of the Wisconsin State Agricultural Society met pursuant to requirement of the by-laws, in their rooms on the evening of February 1, 1870, at 7 1-2 o'clock.

Present—Messrs. B. R. Hinkley (president), Eli Stilson, Rufus Cheney, Nelson Dewey, W. W. Field, J. G. Thorp, N. S. Greene, Saterlee Clark and J. W. Hoyt; Messrs. Atwood, Taylor and Vilas being absent from the state.

President Hinkley in the chair.

The president made some remarks appropriate to the occasion; dwelling in particular upon the necessity for judicious management of the financial affairs of the society during the coming year, the importance of the revision of the prize list for the next exhibition, and the occasion that would probably arise for the consideration of two or more propositions for the re-location of the fair.

Mr. Field moved that the revision of the regulations and list of premiums for the exhibition of 1870 be taken as the first order of business. Carried.

Voted, on motion of Mr. Field, that the regulations heretofore in force, and published for the management of the exhibition of 1869, be adopted as far as to "rules of entry." Carried.

Mr. Hoyt renewed his annual motion for the opening of the exhibition "to the world" and all its inhabitants; which mo-

tion, after quite a protracted discussion in which nearly all members participated, was adopted *nem. con.*

Voted, on motion of Mr. Hoyt, to close the office of entry at two, instead of six o'clock p. m. of Tuesday of fair week.

Mr. Thorp raised the enquiry whether, in view of the change just made, it would not be practicable to have the formal opening occur at two o'clock p. m. of Tuesday, instead of Wednesday, nine o'clock a. m., as heretofore.

The secretary concurred fully in this suggestion as being the next step toward a half day's more time for the exhibition proper. It had been felt at each recurrence of the annual exhibition that the week was too short—that by limiting the fair to five days and devoting two of these to necessary entries and getting articles in place, the *exhibition* was so narrowed down that it was impossible for committees to do their work properly; besides which, in the event of but one single rainy day the society was in great danger of financial ruin.

Remarks to the same effect were made by the president and several other members; and the suggested change having been put in the form of a motion, was unanimously adopted.

Voted, on motion of Mr. Cheney, that each superintendent of a department shall be in duty bound to furnish, as soon as practicable after the fair, a written report of his department, setting forth its character and deficiencies, together with any suggestions as to the future management of the same which by him shall be deemed proper.

In dealing with the "terms of admission," the secretary again strongly urged the propriety and great importance of doubling the price of single admission. Fifty cents was no higher proportionally now than twenty-five cents before the war; the public had become accustomed to paying higher admission fees than formerly and would readily acquiesce. Moreover, it would be impossible in this state, with its scattered population, and the ordinary attractions to which the society was obliged to limit its fairs, to get together a number of people so large as to make the receipts for admission a sufficient resource for the expenses, now considerably increased.

After a full discussion of this question the change was a length agreed upon with entire unanimity.

Adjourned to 9 o'clock, A. M., of Feb. 2.

FEBRUARY 2—9 o'clock, A. M.

The board met pursuant to adjournment.

Present—Messrs. Hinckley, Stilson, Clark, Eaton, Greene, Thorp, Field, C. L. Martin, Cheney and Hoyt.

On assuming the chair, the president announced that the representatives of several localities were present either in person or by written communication, and desired to submit propositions for securing the location of the fair of 1870.

Voted that the reception of such delegations and communications be the next order of business.

The president in declaring this vote invited any persons present and desiring to do so, to present such propositions as they had to offer.

Whereupon Mr. Harrison Ludington of Milwaukee, on behalf of the citizens of that place, submitted the following:

MILWAUKEE, Jan. 28, 1870.

To the President, Secretary and Executive Committee of the Wisconsin State Agricultural Society, Madison:

GENTLEMEN—We are informed that you are to meet at Madison on Tuesday, the first day of February next, for the purpose of locating the next state fair, and that you are willing to locate at the place which will furnish the proper accommodations, and at the same time secure the largest attendance. We, the citizens of Milwaukee, feel confident that no place in the state can offer greater facilities for holding the fair than in our city; therefore, we, the solicitors, do agree to put the fair ground known as the Cold Spring in a suitable condition, and to the satisfaction of your officers (free of all expense) provided that you will locate the fair here for the next two years.

H. Brightman,
Curtis Mann,
Benjamin Bagnall,
Philip Best & Co.,
O. J. Hale,
N. Vankirk,
D. Newhall,
Edw. Sanderson,
H. Ludington,
Chas. Andrews,
Simeon N. Small,
S. B. Davis,
C. D. Nash,
Angus Smith,

S. S. Merrill,
C. T. Bradley,
Nath. Engelmann,
J. A. Noonan,
John Plankington,
D. Ferguson,
A. Green,
Jno. L. Mitchell,
L. Blossom,
J. M. Brown,
Geo. G. Green & Co.,
Green & Button,
John Black,
Smith, Chandler & Co.,

Mann, Bros.,
John Nazro & Co.,
H. Bosworth & Sons,
Blair & Persons,
Atkins, Steele & White,
Goodrich, Terry & Co.,
Dutcher, Ball & Goodrich,
Ricker, Ober & Co.,
John Dahlman & Co.,
Inbusch, Brothers,
J. E. Patton & Co.,
Simonds, Brooke & Wells,
E. B. Wolcott.

Mr. Jones, chairman of the committee of citizens from Oshkosh, presented the claims of that city; promising, in their behalf, to make all the preparations that should be required by the society for the holding of the annual exhibition of 1870, and agreeing that leading citizens should enter into bonds for the fulfillment of these pledges. Mr. Jones was sustained in earnest speeches made by Messrs. Eli Stilson, J. H. Hicks, Dr. ———, and other delegates, who stated that sufficient subscriptions had already been made by the people of Oshkosh, who felt that the northern portion of the state was now entitled to the fair, and were ready to do anything in their power to insure its success, should the location be made at that point.

The following communication from the Dane County Stock and Agricultural Association, was received and read by the secretary:

MADISON, Feb. 2d, 1870.

To the Executive Committee of the Wisconsin State Agricultural Society.

GENTS.—In the absence of the president of the Dane County Stock and Agricultural Association—who has been duly authorized to do so—I tender you the use of the grounds and property of said association for the purpose of holding your next annual fair—on the same terms that you have had them for the past two years.

Very respectfully yours,

GEO. A. MASON.

Treasurer Dane County Stock and Agricultural Association

Following these propositions remarks were made by Dr. Martin, Mr. Eaton and other members, as well as by Messrs. Ludington and H. L. Palmer, who were invited to submit such remarks as they desired to make.

The President having reminded the board that there was no question before them, Mr. Clark submitted the following resolution:

Resolved, That the proposition of the city of ———, for the location of the state fair for 1870 is hereby accepted, and that the president, secretary, and three other members of the board, (to be appointed by the president), shall be a committee with full authority to carry out this arrangement, under such directions as the executive board may determine.

On motion of Mr. Field, the board proceeded to an informal

ballot to fill the blank in said resolution, with the following result: Milwaukee six votes, Oshkosh four.

Moved that further action upon the question of location be postponed until the afternoon session. Carried.

Voted that board devote the remainder of the morning session to the preparation of a list of premiums on stock.

Mr. Hoyt urged the propriety of offering better inducements for the preparation of carefully written essays on practical questions important to the industry of the state. There ought to be, and undoubtedly were many persons competent to furnish valuable information, which if published would add greatly to the value of the annual volume of transactions, but thus far the premiums offered in this department had been almost entirely fruitless.

Voted that the premiums offered for essays on subjects to be prescribed by the secretary, to the number of twelve, be \$25 for each accepted paper submitted.

After a number of unimportant changes in the list of 1869, "Division A.," embracing all domestic animals, was adopted as published in said list.

On motion, adjourned to meet at 2 o'clock P. M.

FEBRUARY 2—2 o'clock P. M.

The board met pursuant to adjournment.

Present—same members as before.

The president declared the first business in order to be the further consideration of the question of the location of the next fair.

Mr. Clark stated that inasmuch as members of the board not heretofore present during the session, were expected to arrive in time for the evening session, he would move a postponement of the vote on location until after 7 1-2 o'clock, and that the board proceed meantime with the prize list. The motion was adopted.

The list of premiums for "Division B" (products of the earth) as finally published, was completed during the afternoon.

A proposition from the State Horticultural Society, presented by a delegation of the members, expressing a desire to unite with this society in the exhibition of fruits and flowers, and offering to be responsible for the preparation of a suitable list of prizes and for the entire immediate management of that department of the exhibition subject to general regulations of the agricultural society : *provided*, said society would pay the expense of such management and appropriate to the Horticultural Society the sum of \$600.00 for the payment of premiums, was received, and after due consideration formally accepted.

At 6 o'clock, adjourned to meet at 7. P. M.

FEBRUARY 2—7 o'clock, P. M.

Board met pursuant to adjournment. Present—same members as before with the addition of Gen. Atwood, not heretofore present, on account of detention by duties at Washington.

The president, on taking the chair, declared the business first in order to be the renewal of the consideration of the question of a location of the exhibition.

Dr. Martin, after some remarks moved that the board proceed at once to a formal ballot for location.

Several persons interested desiring to express their views, general leave was granted. Whereupon quite a lengthy discussion arose as to which location of those under consideration should be adopted; Messrs. Hinkley, Stilson, Martin, Clark, and other members, participating.

Each member recognized the claims of the northern portion of the state, and the zeal and fidelity of the citizens of Winnebago county entitled Oshkosh to the location if it should be thought advisable to hold the next exhibition anywhere in that region. On the other hand, the financial necessities of the society, the importance of better railroad facilities, and the probability of a larger attendance at Milwaukee were also urged with much force.

The ballot having been ordered, and the votes counted, it was found that of the twelve ballots cast, six were for Milwaukee, five for Oshkosh, and one was blank.

The second ballot gave eight for Milwaukee and five for Oshkosh. Whereupon the president declared that the location of the fair had been made by the acceptance of the proposition made by the citizens of Milwaukee.

Upon which announcement the thanks of the delegation and of the city of Milwaukee were tendered in a handsome speech made in their behalf by Hon. H. L. Palmer, who assured the board that nothing should be wanting on the part of Milwaukee necessary to a satisfactory demonstration of the wisdom of the society in making the decision it had.

The president appointed Messrs. Clark, Green and Stilson to act in connection with the president and secretary as the committee of arrangements provided for in the resolution fixing the location. Mr. Stilson said it would be very inconvenient for him to attend to the duties imposed, and desired to be excused. Whereupon the name of Mr. Cheney was ordered to be substituted.

At 10 o'clock the board adjourned to meet at 9 o'clock, A. M., of Feb. 3.

FEBRUARY 3—9 o'clock, A. M.

Board met at the hour agreed upon.

Present—the twelve members in attendance upon the last session.

President Hinkley in the chair.

On motion, the board resumed their labors upon the list of premiums, and continued the same until the completion thereof. In the course of the session, considerable discussion arose as to whether premiums should be offered on implements and machinery. Some members urged that premiums were an encouragement due to the manufacturers of such articles, and necessary to insure a full exhibition in this department. Others insisted that manufacturers not only cared much more for the opportunity thus afforded them for advertising their wares to any public than for the premiums that could be offered by the society, but that a very large majority of them

preferred the judgment of the people to risking the reputation of valuable implements and machinery to the verdict of a committee liable to be composed in whole or in part of persons already prepossessed or prejudiced in favor of a particular patent of which they might have superior knowledge. This was not a rule that would apply to other departments, for the reason that in no other was the strife so great between competitors.

When the vote was finally taken it was in favor of offering *free exhibition* but no premiums at all in the classes embracing machinery and implements for agricultural purposes.

There was also a decided difference as to whether equestrianism should not be abolished, as being irrelevant and detracting from the character and dignity of our industrial exhibition. Against this view its continuance was urged on the grounds, that the exhibitions would necessarily be failures in every important sense unless the public were present to profit by the instruction and pleasure they were intended to afford that it was one proper object of such exhibitions to promote social intercourse among the people of different sections of the state, and that it would be impracticable to secure a large attendance from a population so sparsely distributed over wide areas, however good the exhibition as such, unless entertainments attractive to the body of the people are included.

Equestrianism was continued for another year by a close vote.

The list of premiums having been completed, at twelve o'clock the board adjourned to 2 P. M.

FEBRUARY 3,—2 o'clock P. M.

The board met pursuant to adjournment; the original number of twelve being present.

President Hinkley in the chair.

The appointment of officers to have immediate charge of the exhibition, together with the necessary awarding committee having been announced as the next order of

business, the board proceeded to the election of a marshal, superintendents of the several departments, and a ticket accountant, with the following result:

Marshal—Wm. R. Taylor, Vice President.

Superintendent of Gates—David Williams, Ex-President.

Superintendent of Horse Department—N. S. Greene, Member of the Board.

Superintendent of Cattle Department—C. H. Williams, Vice President.

Superintendent Sheep Department—Eli Stilson, Vice President.

Superintendent Swine and Poultry Department—Jas. Baker.

Superintendent Agricultural Department—W. W. Field, Member of the Board.

Superintendent Machinery Department—Rufus Cheney, Vice President.

Superintendent Department of Manufactures—Saterlee Clark, Vice President.

Superintendent Department of Fine Arts—J. O. Eaton, Member of the Board.

Superintendent Department of Personal Effort—The Marshal.

Ticket Accountant—D. H. McArthur.

The great difficulty annually experienced by the society in securing the attendance of the committees of judges appointed, and the patient and faithful discharge of the delicate and responsible duties imposed upon them, gave rise to a discussion of the question: How can this serious embarrassment be overcome?

The board takes the utmost pains from year to year in making these selections, and each appointee is afterwards especially addressed by the secretary, asking his acceptance. And yet, notwithstanding all this care and pains-taking, the actual attendance and performance of duty at the exhibitions does not average more than thirty per cent. of those thus appointed and pledged.

As a consequence, a great majority of the judges must be selected from the multitude on the grounds after the exhibition has been formally opened. This necessarily delays the work of inspection, crowding the work of three days into but little more, and sometimes even less than one. Moreover this method of appointment is extremely hazardous, in that persons

incompetent or partial are liable to be put in the way of the board for personal or more important reasons, and accepted by the board, unsuspecting of the selfish or sinister intent, because the work must be done, and time is not afforded for a careful inquiry into the qualifications of the person so presented.

These facts were urged with much force by several members, and some remedies were suggested without, however, meeting the full approbation of the board.

The policy of paying the judges did not seem practicable, for the reason that very small pay would constitute no sufficient inducement, and that the sufficient compensation of one hundred and fifty judges would be quite beyond the means of the society. If the compliment of an appointment to positions of so great importance to the industry of the state, with the usual free season ticket, refreshment tickets, etc., were insufficient, so also would the few dollars within the ability of the society to pay. Besides which, it was urged that, as a rule, they who were competent to serve on the committees would prefer to do it *pro bono publico* to receiving a paltry sum of money therefor.

It was finally resolved to diminish the number of judges; placing two or more classes when the same should be found practicable, under the inspection of one set of judges. This would necessarily increase the amount of labor to be performed by those who should actually serve; but it was thought to be easier to find a comparatively small number of public spirited citizens and friends of the society in the habit of attending the exhibitions, who would cheerfully perform the responsible duties thus imposed, than to secure the needed careful inspection and right decisions in any other way.

The committees being filled out on the basis of this decision, the board adjourned to 7 1-2 o'clock, P. M.

FEBRUARY 3—7 1-2 o'clock, P. M.

The board met at the hour appointed, and occupied the evening session with the settlement of various miscellaneous

questions relating to the exhibition and the general affairs of the society.

Mr. Hoyt submitted an informal resignation of the office of secretary. He said that having held the office for more than ten years, during which time he had formed strong attachments both for the work to which he had been devoted and for those who had been so intimately associated with him in it, it was with no little reluctance that he was constrained to this course. But that his past labors had been at so great a sacrifice of personal and pecuniary interests, that now, at the end of so long a period of public service, he felt it to be not only his privilege but a duty to himself and family, whose necessities had outgrown the present means of supplying them. He farther stated that these views were confirmed to himself, and are susceptible of being established in the judgment of his associates in the board, by the fact that during the past years, other fields of labor had been opened to him upon which he would have entered had he consulted his own interests merely, and that he had under consideration at this time a definite proposition from a neighboring state by the acceptance of which he could more than double his present income.

Several members expressed regret that the compensation heretofore made to the secretary for the onerous and responsible duties of his office had been so much less than adequate, as well as their extreme reluctance to part with his services, and the hope that it would be possible to devise some plan under which he would find it possible to strengthen his resources and yet continue his labors in behalf of the society and of the general interests of the state.

In pursuance of which, on motion of Governor Dewey, it was proposed that the unanimous consent of the board should be given to the assumption by the secretary of any other duties and responsibilities, whether in Wisconsin or elsewhere, that would not be incompatible with the general direction and efficient management of the affairs of this society, and the hope expressed that upon the basis of the liberty of action thus

granted, he would find it possible to indefinitely postpone his resignation. Besides which the president and other members offered by extra labors on their own part to give to the secretary larger liberty as to time, and the performance of other duties than he would otherwise have.

In response to this highly complimentary action of the board and to the offers so kindly made by individual members thereof, the secretary in a few appropriate remarks returned his warmest thanks for the generous concessions made by them in his interest and accepted the terms offered as the basis of his continuance during the remainder of the year.

The accounts of the several members for their expenses in attending this meeting having been audited, on motion the board adjourned *sine die*.

NEWHALL HOUSE,

MILWAUKEE, WIS., September 26, 1870.

The executive board of the Wisconsin State Agricultural Society met in the office of the society, which had been temporarily established at room number two, Newhall House, at seven o'clock, P. M.

Present—Messrs. B. R. Hinkley, president, David Atwood, treasurer, and Messrs. Wm. R. Taylor, Rufus Cheney, Eli Stilson, W. W. Field, Saterlee Clark, N. S. Greene, Nelson Dewey, C. H. Williams, L. B. Vilas, J. O. Eaton, and J. W. Hoyt.

President Hinkley in the chair.

The president on behalf of the committee of arrangements, of which he had acted as chairman, made a satisfactory statement of the condition of the fair grounds, complimenting the local committee of citizens upon the interest they had manifested in the success of the exhibition, and the pecuniary sacrifices they had made in putting the grounds and buildings in good shape for the society's use.

Various matters of detail affecting the readiness of the differ-

ent departments were discussed, the temporary importance of which does not warrant their inclusion in the record for publication.

The secretary reported that the entries already made outnumbered those of any former exhibition upon the corresponding day. Also that nearly one hundred life membership certificates and tickets had been issued; all of which evidenced a lively interest in the society and the exhibition soon to be inaugurated.

The question of admitting carriages on life members' tickets, contrary to the rule heretofore enforced, was brought up and after considerable discussion it was decided to waive the enforcement of said rule at this time.

The Board then adjourned to meet each succeeding evening at 7 o'clock during the continuance of the fair.

Which meetings were held accordingly.

NEWHALL HOUSE,

MILWAUKEE, October 4, 1870.

The executive board met at their office in the Newhall House to audit accounts and pay bills and premiums.

Present—The members of the auditing committee.

President Hinkley in the chair.

After the settlement of all claims presented, on Thursday the 6th at 4 o'clock, the board adjourned *sine die*.

DECEMBER MEETING.

STATE AGRICULTURAL ROOMS,

MADISON, December 6, 1870.

The executive board met in these rooms, pursuant to a requirement of the by-laws, on Tuesday evening, Dec. 6, 1870, being "the day preceding the date of the annual meeting of the society."

Present—Messrs. B. R. Hinkley, president; Wm. R. Taylor, Saterlee Clark, Eli Stilson, Rufus Cheney and J. G. Thorp, Vice Presidents; Nelson Dewey, W. W. Field, C. Loftus Martin, J. O. Eaton, N. S. Greene, J. H. Warren and L. B. Vilas, additional members, and J. W. Hoyt, secretary.

President Hinkley, in the chair, said it was the object of the December meeting to close up the fiscal affairs of the society for the year and to attend to any general business that might come before the board. The fiscal year of 1870 had brought important results; relieving the society from all the embarrassments under which it had labored temporarily, and leaving the treasury, as he presumed to say, in a highly satisfactory condition.

The secretary asked the attention of the board to the purchase made by the president and himself on behalf of the society of the real estate known as the "State Fair Grounds" at Madison, embracing fifty-three acres, and suggested the propriety of formal action upon the same by the board. For the better information of such members as had not learned all the details of the transaction, he would briefly recount what had been done by the president and secretary, with the reasons therefor.

Previous to the fair of 1869, the said property, then belonging to what was known as the Bruen estate was advertised for sale at public auction, at Madison, on one of the days appointed for said exhibition. It was uncertain whether the society would receive acceptable propositions from any other locality for the holding of subsequent exhibitions. The said grounds, upon which several fairs had been held, were admirably adapted to the use of the society. Moreover, they had been improved and fitted up by the Dane county stock and agricultural association at an expense of \$15,000; which improvements were offered the state agricultural society, either as a donation or as a perpetual lease for future exhibitions, in case said society would purchase the real estate, and thus save the breaking up and practical loss of all that had been done to prepare them for its use.

Knowing that these grounds were the only available piece of property in the vicinity of Madison for fair purposes, and that the sale of them to private parties would therefore result in practically striking Madison from the list of the very few cities that could possibly accommodate the society, it seemed to them important that the purchase should be made for the society. Accordingly, after consultation with such members of the board as were accessible, the president determined to attend the sale and bid in the property, should it be sold at a moderate price. The agent of the heirs owning it having established a minimum price which was believed to be above its real value, the land was not sold at that time.

Subsequently, to-wit, on the first day of December, Judge Guild, of Philadelphia, who was the senior heir and the agent for the property, offered it to the society at \$6,000; payable as follows: five per cent. in hand, upon the execution of a contract for a deed; thirty per cent. at the end of twelve months, when a warranty deed was to be delivered to the purchaser; and the remainder within ten years from date of purchase, deferred payments to bear seven per cent. interest, payable semi-annually.

These terms it was thought best to accept, and a contract was entered into accordingly; the secretary paying the five per cent. in behalf of the society out of his own private funds.

At the end of the twelve months named, to-wit: on the 2d day of December, being in advance of the date fixed in the constitution of the society, for the regular meeting of the board, he had paid the thirty per cent. then due, taking a receipt therefor in the name of the society, trusting to it for the ratification of what had been done and for reimbursement. With this statement of the facts he left the matter in the hands of the board.

Mr. Field thought the president and secretary were entitled to the thanks of the society for making a purchase of property the possession of which, at the time of contracting therefor, appeared to be highly important, if not necessary, and

moved that the said act be ratified by a formal vote of the society, and that the proper officers be instructed to draw an order on the treasury for the sum of twenty-five hundred and twenty-nine dollars (\$2,529) in favor of the secretary, to reimburse him to the full extent, principal and interest, for thirty-five per cent. of the purchase price by him already paid.

The motion having been seconded a quite lengthy discussion arose as to the propriety of its adoption, Messrs. Field, Martin, Cheney, Clark, Vilas and others taking part therein. All agreed in approving the course taken by the president and secretary in making the purchase, and all favored the ratification of their act, if it was necessary to save them from loss.

The question having been raised whether the secretary would not be willing, or even prefer, to make the purchase his own and thus relieve the society from all further responsibility in the matter, he replied that personally he would have no objection to doing so, since he believed the property to be worth all and more than the price at which it had been bought, but that, if it was true, as had been reported, that several private parties would be glad to buy it at an advance upon six thousand dollars, it would hardly be proper, certainly not for the interest of the society, that he should take it at less than the highest price that could be got for it. Furthermore it was not optional with him to settle the matter in that way, but rather with the former proprietors, since the contract for a deed was taken not in his own individual name, but rather in his official capacity; so that, if the society refused to ratify, the result would be a forfeiture of what had been paid and a return of the property to the Bruen heirs.

On motion the board adjourned to nine o'clock A. M. of Wednesday, Dec. 7.

DECEMBER 7—9 o'clock A. M.

The board met pursuant to adjournment.

Present—same members as before.

President Hinkley in the chair.

Discussion of the motion pending at the hour of adjournment last evening was resumed.

The secretary stated that he had received credible information since the time of adjournment that certain responsible citizens of Madison would be glad to purchase the fair grounds at a handsome advance upon what had been paid. Under these circumstances he could not consent to be the recipient of any special favors in the matter, but should be considered as upon the same footing with every other citizen of the state.

Mr. Cheney suggested that the farther consideration of the motion to ratify be postponed until the February meeting of the board, when two new members would have a voice in the decision.

Other members did not believe the postponement would change the result and insisted that it was better to settle the matter at once. Afterwards the society could easily sell the property should it seem proper to do so.

The vote having been ordered, the motion was carried almost unanimously; Mr. Cheney alone voting in the negative.

On motion, the board then proceeded to an inspection of the accounts of the treasurer and secretary, and the settlement of other important business.

The report of the treasurer was submitted through his agent, Mr. H. A. Lewis; Mr. Atwood being necessarily absent at Washington in the discharge of his duties as representative of the second district of the state in congress. The receipts into the treasury for the year were \$23,495.23; the disbursements, \$13,777.46; balance in treasury December 7, 1870, \$9,717.77.

[For statement in full see report as published under the head, "Annual Meeting of the Society."]

By request of the secretary a committee of three members was appointed to examine his personal account with the society and report thereon to the board. The committee named by the president, consisted of Messrs. Clark, Stilson and Field, who, after due investigation, reported by Mr. Clark, chairman, that the amount of the society's indebtedness to the secretary,

independent of the amount of \$2,529 advanced by him on the purchase of the fair grounds—which amount he had already been ordered repaid—was \$775.58, including balance due on the loan of \$1,000, made by him November 4, 1869, the interest thereon, the interest on his regular salary, for which he had been obliged to wait at considerable inconvenience and pecuniary loss, balance due on salary up to January 1, 1871, and the sum of \$69 paid out as traveling and incidental expenses in attending to the interests of the society during the year.

On motion, the report of the committee was approved, and the secretary authorized to draw on the treasurer for the full amount of said indebtedness.

The secretary called the attention of the board to the fact that since the date of their last meeting, there had been organized and chartered a state institution known as the "Wisconsin Academy of Sciences, Arts and Letters," whose character and aims were such as to entitle it to the formal recognition of the State Agricultural Society. He therefore submitted for the consideration of the board a series of resolutions to that end, which, if unanimously approved by the members thereof, he desired to offer for the society's adoption at the annual meeting, soon to be convened.

Which resolutions, after some enquiries and explanations, were generally concurred in.

[See resolutions under the head of annual meeting of the society.]

After the presentation and auditing of bills for the expenses of members in attending the meeting, the board adjourned *sine die*.

SOCIETY MEETINGS.

MEETING FOR THE ELECTION OF OFFICERS.

CITY HALL, MILWAUKEE, Sept. 29, 1870.

The annual meeting for the election of officers of the Wisconsin State Agricultural Society was convened pursuant to published notice in the City Hall, at Milwaukee, on the evening of September 29th, at 7 1-2 o'clock.

A large number of life members were present.

The meeting was called to order by B. R. Hinkley, president, who stated the object to be the election of officers of the society for the ensuing year.

Hon. H. L. Palmer moved that the chair appoint a committee of five to nominate persons suitable to fill the several offices prescribed in the constitution. Carried.

The following members were appointed accordingly: H. L. Palmer, Milwaukee; E. P. Brockway, Ripon; O. S. Willey, Madison; J. O. Eaton, Lodi; Nelson Dewey, Cassville.

The committee retired for consultation and the preparation of their report. During their absence, the secretary made some general remarks touching the affairs of the society, and read from Vol. VIII. of the Society's Transactions, just out of press, and copies of which were declared ready for delivery, the treasurer's report of the financial transactions of the previous year. He also mentioned the fact that at the annual meeting of the society in December, 1869, notice had been filed with him of an intent to offer at the annual meeting of 1870 an amendment to the constitution, giving to the Wisconsin Academy of Sciences, Arts and Letters a representation, by its president and general secretary, in the executive board of the State Agricultural Society.

The committee on nominations returned and presented the following names:

President—B. R. Hinkley, Waukesha.

Vice Presidents:—1st Congressional District—Rufus Cheney, Walworth; 2d Congressional District—W. R. Taylor, Dane; 3d Congressional District, C. H. Williams, Sauk; 4th Congressional District—Sat. Clark, Dodge; 5th Congressional District—Eli Stilson, Winnebago; 6th Congressional District, John T. Kingston, Juneau.

Secretary—J. W. Hoyt, Dane.

Treasurer—Harrison Ludington, Milwaukee.

Additional Members of the Executive Board—C. L. Martin, Rock; N. S. Greene, Jefferson; W. W. Field, Grant; J. O. Eaton, Milwaukee; John L. Mitchell, Milwaukee; N. D. Fratt, Racine; J. H. Warren, Green.

Which nominations were confirmed by a vote of the members present.

Hon. H. L. Palmer offered the following resolution:

Resolved, That this meeting takes pleasure in expressing its high appreciation of the accuracy, fidelity and integrity with which the Hon. David Atwood has for so many years performed the duties of treasurer of this society, and beg to assure him that in or out of office he has our highest esteem as an officer and gentleman.

Which was unanimously adopted.

On motion, the society adjourned *sine die*.

ANNUAL MEETING.

STATE AGRICULTURAL ROOMS,

MADISON, December 7, 1870.

The society met, pursuant to constitutional requirement, on Wednesday, December 7, at three o'clock p. m., for receiving the report of the treasurer, adjusting the finances of the society, acting upon proposed amendments to the constitution, and transacting any other general business that might come before the meeting.

Quorum present.

President B. R. Hinkley in the chair.

On behalf of the executive board, the secretary presented a general statement of the condition of the society, together with the following—

REPORT OF THE TREASURER.

To the Executive Board of the Wisconsin State Agricultural Society:

The financial transactions of the Wisconsin State Agricultural Society for the past year have been as follows:

RECEIPTS.

1869.

Dec.	To balance in treasury, as per last report . . .	\$678 77	.....
	To cash received from sale of tickets at fair of 1870	16,956 50	.....
	To cash from rents.....	2,221 50	.....
	from life memberships.....	2,140 00	.....
	from entries.....	995 50	.....
	received at gates.....	138 00	.....
	received from amphitheatre.....	334 65	.....
	received for grain sold.....	30 31	.....
		<hr/>	\$23,495 23

DISBURSEMENTS.

1870.

Dec.	By cash paid on orders this day (December 7) returned and cancelled from No. 1 to No. 299 inclusive, said orders paid covering the following items:		
	For premiums, exclusive of medals.....	\$5,378 05	.....
	secretary, including portions of indebtedness on loan.....	2,548 15	.....
	office expenses, including postage and expressage	216 97	.....
	expenses of members in attending meetings	178 20	.....
	printing and advertising	684 80	.....
	superintendence of preparation of grounds and of exhibition.....	1,278 53	.....
	clerical service.....	627 52	.....
	police service and labor.....	1,128 75	.....
	forage used during fair	634 50	.....
	articles purchased for fair, signs, etc ..	289 85	.....
	omnibus hire and livery.....	109 34	.....
	refreshments for officers, judges and guests during the fair	452 00	.....
	machinery for power hall.....	120 15	.....
	miscellaneous expenses of exhibition..	130 66	.....
		<hr/>	\$13,777 46

Balance in the treasury December 7, 1870. \$9,717 77

All of which is respectfully submitted.

DAVID ATWOOD, *Treasurer.*

The president stated that the report just submitted had been

carefully examined by the board and compared with the vouchers and records kept by the secretary. It was the custom of the society, however, and a proper custom, to appoint its own committee to make such investigations into the financial transactions as to them may seem proper.

On motion, a committee was appointed, consisting of Messrs. Rufus Cheney, J. G. Thorp and Eli Stilson to inspect the records and accounts of the treasurer and secretary and report to the meeting as soon as practicable.

The following is the

REPORT OF THE COMMITTEE OF EXAMINATION.

To the President of the Wisconsin State Agricultural Society:

The committee charged with the examination of the report of the treasurer, having examined the same, with the accompanying vouchers and records of the secretary, respectfully report that they find the said accounts correct, and that bills and vouchers for the several items are on file and open to inspection in the office of the society.

RUFUS CHENEY,
J. G. THORP,
ELI STILSON,

Committee.

STATE AGRICULTURAL ROOMS, Dec. 7, 1870.

Which on motion was unanimously approved.

The secretary offered the following resolutions, accompanied by a few general remarks and then moved their adoption :

Whereas, there has been recently organized in this state, and chartered by the legislature, an institution known as the " Wisconsin Academy of Sciences, Arts and Letters ;" and *whereas*, said academy embraces among its leading objects the advancement of the various industrial arts by the applications of science and the encouragement of original invention, and is therefore closely allied in character to this society ; and *whereas*, said academy contemplates as is evidenced by the very terms of its constitution and charter, a friendly and cordial co-operation with the State Agricultural Society ; therefore,

Resolved, That this society does hereby offer to the said Academy of Sciences, Arts and Letters its most cordial sympathy and co-operation.

Resolved, That, as a means of establishing a more intimate relation between the two organizations, the society offers to said academy a representation in its executive board, and that, to this end, it will amend its own constitution accordingly.

Resolved, That, in further evidence of its desire to promote the success of said academy, the society does hereby grant to it the joint use of that one of its apartments at present occupied by scientific collections, and that, in order to the earlier formation of a valuable museum of the natural products of Wisconsin, such collections already formed, and at present preserved in said department, are hereby donated and conveyed to the said academy.

After a few remarks and inquiries touching the collections to be conveyed, on motion, the above resolutions were unanimously adopted.

The secretary then proposed the following amendment to the constitution of the society, stating that the same was duly filed at the date of the previous annual meeting and read at the next subsequent meeting for the election of officers :

Article III of the constitution of the Wisconsin State Agricultural Society, entitled "Of the Officers," is hereby amended by inserting after the words, "the ex-president latest in office, the following, to wit : "and the president and general secretary of the Wisconsin Academy of Sciences, Arts and Letters."

Which, on motion, was unanimously adopted.

Whereupon the society adjourned *sine die*.

EXHIBITION OF 1870.

The seventeenth general exhibition of the society was held on what has long been known as the Cold Spring Grounds in the suburbs of Milwaukee.

These grounds embrace some sixty acres, and are well adapted to such uses. They had been greatly improved during the summer, at the expense of Milwaukee citizens, by the removal of stumps, the smoothing over of many rough places, the construction of new carriage ways, so as to make them accessible on three sides, by the improvement of old buildings and the construction of many new ones, including five large exhibition buildings for the departments of agriculture, horticulture, operative machinery, manufactures and fine arts, each forty-five by one hundred feet, together with some eighty new and permanent stalls for horses, and several hundred temporary stalls and pens for cattle, sheep, swine and poultry.

They were accessible from every quarter but one by carriage and on foot, and on the northwest side by rail; the new northern branch of the Milwaukee and St. Paul Railway passing so near as barely to leave room for platforms for passengers and machinery between the track and the enclosure. The chute for the taking off and loading of cattle, etc., passed all stock arriving by rail directly from the cars into the grounds. The track, always popular, had been much improved and a handsome judge's stand had been built to such a height that the judges could overlook all intervening buildings and note the movements of horses upon the track from the starting off to the coming in.

The railroad company cordially entered into the society's plans by arranging to have trains arrive early in the forenoon

upon all the roads and return to outward points in the evening. Not only so, but passengers arriving from the north and northwest by the N. B. of the St. P. R. R. were set off at the grounds if they so desired, while those coming from the west, southwest and south were taken up at the main depot, where they all necessarily arrived, and taken directly to the grounds, at an expense of twenty-five cents for the round trip, upon special trains which plied back and forth every few minutes from early morning until late in the evening. Could the obliging superintendent have anticipated so vast a throng as pressed for room upon these excursion trains, still more extensive accommodations would have been provided. But in these, as in the matter of hack and omnibus and even hotel accommodations, one state fair was necessary to prepare them for such a realization of the needs of the public as would enable the parties concerned to do themselves and the public the fullest justice. As it was everybody, except the few who suffered from the larger than usual number of pickpockets, appeared to be pleased with the exhibition and with the cordial treatment they received from the city and people of Milwaukee.

The delightful weather was a fruitful theme for remark, as it was indeed a just cause of gratitude on the part of all concerned.

THE ENTRIES

Made in the several departments were in number as follows:

Division A, domestic animals	647
Division B, products of the earth	563
Division C, machinery, manufactures and works of art.....	881
Division D, personal effort (equestrianism, etc.).....	6
Total.....	<u>2,097</u>

THE FORMAL OPENING

Was made on Tuesday, P. M., at 2 o'clock, by a brief and appropriate address from President Hinkley, which, with the other addresses delivered during the fair, will be found in their appropriate place, at the end of this general account.

As the opening was nearly a day earlier than ever before, some anxiety was felt as to whether the different departments would be ready at the time appointed. The result proved the wisdom of the arrangement. The heavy machinery had mainly complied with the new rule and was in place and ready to move at the throb of the steam engine. The long avenues, so handsomely arranged by the superintendent of operative machinery, were lined with attractive implements of nearly every conceivable sort. The horses, cattle, sheep, swine and poultry, with the exception of some few animals that were unavoidably delayed in the starting or on the way, were in their stalls; and more entries than ever before since the organization of the society were on the books of the secretary.

The address concluded, the secretary called the roll of the judges who had been appointed to examine this multitude of exhibits and award the premiums. And now came the sore trial of the board. Not more than half of those who promised to perform this arduous but responsible and honorable service were there. As must always be the case, the president's hands were more than full with gathering up the odds and ends in parts of the exhibition, and getting the whole machinery of this complex organism known as a state fair nicely in operation, each superintendent was in constant demand in his own department, the treasurer was as busy as possible in arranging his large clerical force to meet the expected assault for tickets, and the secretary had need to be everywhere simultaneously, and to answer from ten to one hundred questions a minute.

Not the most favorable conditions, certainly, for the important judicial work of weighing the qualities and qualifications of men, and inducting them into the business of awarding committees!

At length, however, the committees were filled, and the members thereof engaged zealously in their work—with varying results of course, which, in some cases, left knotty questions to be settled by the executive board, and yet in the main with very good satisfaction to the society and public.

So much of the embarrassments under which the board annually labor has been recited that those who are hereafter appointed may exert themselves if necessary to fulfil their engagements, and any exhibitors who occasionally suffer—as must inevitably be the case sometimes—may the better understand how blameless is the society for the errors committed by judges of their appointment.

Wednesday, September 28, proved an auspicious day, bringing a very large attendance of people and astonishing receipts at the ticket office, thanks to an excellent exhibition, the perfect weather and the new price of single admission tickets. The programme, which embraced the operation of machinery, trials of speed by thoroughbred horses, and, incidentally, a review of Wisconsin soldiers of the late war by the governor and several distinguished generals, was well executed and gave excellent satisfaction.

Thursday was no less delightful, as to weather, and no less satisfactory in the entertainment afforded, a chief feature of which consisted of an admirable address from that distinguished citizen of our common country, the Hon. Horatio Seymour, recent governor of New York and still later the candidate of a great party for the presidency of the United States. [A synopsis of this address will be found immediately after the president's opening address.]

The attendance of the people was thought by some to exceed anything ever before experienced in the history of the society. The multitudes that thronged every building, the amphitheatre, and moved in dense masses all over the grounds were themselves a spectacle worth the going a long way to see. The total number was variously estimated at from twenty to thirty thousand persons.

Thursday evening was devoted to the annual election of officers for 1871; which was held in the city hall, with the results recorded in the minutes of the meeting, published on page 120.

Friday opened a little cloudy, but at length proved itself the peer of the faultless four preceding days.

At 12 o'clock excellent addresses were delivered by Governor Austin of Minnesota, Governor Fairchild of Wisconsin and Charles Seymour, Esq., of La Crosse; all of which, as reported in the daily papers of Milwaukee, will be found in this volume.

The trials of speed which were several and generally creditable to Wisconsin stock, were well reported in the Milwaukee *Sentinel*, from whose columns, for the gratification of the parties interested and of others who delight in fleet horses, we quote the following :

THE RUNNING HORSES.

This race proved to be one of the most interesting of the fair, and upon the whole was as fine a race as was ever run on Cold Spring course. There were three entries, John Ross, of Mineral Point, naming Canada, J. B. Cutting, of Darlington, naming Twenty Cents ; H. W. McAfferty, of Columbus, naming Kitty Stacey. In the drawing, Kitty Stacey won the pole, Twenty Cents the second, and Canada the outside place. The race was for a premium of \$100 to the first, and \$50 to the second, mile heats, best three in five.

First Heat.—An excellent send-off was obtained, Kitty and Canada struggling for the lead. At the eighth-mile they were neck-and-neck, and continued around the track in that position and down the home stretch, and though each strained every nerve to gain the advantage, they passed the string together, and the heat was declared dead. Time, 1:47 $\frac{3}{4}$. No finer specimen of running was ever seen on the track. Twenty Cents apparently made no effort to win, but simply saved a distance, coming in quite fresh.

Second Heat.—The horses were up to work on time, and obtained a fair start. Canada was slightly behind, and fell still further in the rear before reaching the half-mile stake. At that point he commenced to gain, and pressed Kitty hard down the back stretch, and on turning down home he was neck-and-neck with her. Both animals ran handsomely, each being determined to win. When within eighty yards of the stand, by a prodigious effort Canada obtained the lead and passed the string half a neck ahead of Kitty in 1:48 $\frac{3}{4}$.

Third Heat.—The excitement among the spectators was intense, and the horses started amid loud cheers. This time Twenty Cents, who had been held back heretofore, was put to his full speed, and took the lead from the start, Kitty following and Canada bringing up the rear. On the back stretch Canada gained on Kitty and passed her on the turn, pressing Twenty Cents closely up the home stretch, but notwithstanding the speed made he was unable to overtake the sorrel, and took the heat in 1:49, Canada being a length behind, and Kitty third.

Fourth Heat.—The knowing ones now felt confident that the superior bottom of Twenty Cents would win him the race, and bets were freely offered on him. On the start Canada shot ahead, but was lapped by Twenty Cents. Down the back stretch they ran neck-and-neck, scarcely an inch of advantage being gained by either. Twenty Cents gained on the turn and maintained the advantage nobly, Canada lapping him down the entire quarter, coming in only half a length behind. Twenty Cents took the heat in 1:51 $\frac{1}{4}$.

Fifth Heat.—The excitement was at its height Kitty took the lead and held it for the first half mile, when she was passed by Canada, who was neck-and-neck with her on the turn of the last quarter, Twenty Cents lapping. At this point the latter again gained an advantage, and by dint of hard running passed both of the others, winning the heat over Canada by a single neck, Kitty barely saving a distance. Time 1:51 $\frac{1}{2}$.

With a cavalcade of the premium horses the programme was concluded. And thus ended an exhibition which for the fullness of its several departments, the variety and excellence of its exhibits, and especially the magnitude of its receipts—which amounted to \$22,818.46—has never been paralleled in Wisconsin, nor, with perhaps a single exception, approached by any similar exhibition in the neighboring states.

OPENING ADDRESS.

Delivered on the Fair Grounds, September 27, 1870,

BY B. R. HINKLEY, PRESIDENT.

Fellow Citizens: After the lapse of eleven years, we are again assembled at this beautiful and prosperous metropolis to inaugurate a general exhibition of the industry of Wisconsin.

It is needless to say that great changes have occurred in the industrial condition of the state since that date. Our agriculture, mining, manufactures and commerce have all made wonderful progress. Then the state was in its infancy: now it has attained to its majority, and is making strides that will soon give it rank among the foremost of the great states of the Union. As a society, it has been our endeavor to aid in this work of development. It is reasonable to conclude that our labors have not been in vain—that the improvements observable in our system of agriculture, and in the cultivation of fruits, as well as the remarkable growth of our manufactures and commerce, are in some degree attributable to the zealous and unremitting efforts put forth by this organization.

Gentlemen of the society, we have reason to congratulate each other, the society itself and the city of Milwaukee, upon the success attendant on the endeavors to make this, our seventeenth exhibition, pre-eminently successful; and I am glad of this opportunity to publicly thank the citizens of every portion of the state for the spirited manner in which they have responded to our calls for efficient co-operation. Especial thanks are due the city of Milwaukee, so many of whose citizens have contributed to the fund by means of which these excellent improvements have been made for the accommodation of all, and to the handsome display of articles here presented, and who by the generous manner in which they have supported the society in the furtherance of its plans, have fully redeemed the pledges made by their representatives in urging the loca-

tion of the fairs of 1870 and 1871 at this place. The cordial thanks of the society and of the public are also due to the railroad and steamboat companies, especially the Milwaukee and St. Paul Railway Company, whose generous and energetic efforts to provide every possible facility for the attendance of exhibitors and people have contributed so much to the general results.

If in any portion of the state dissatisfaction has been felt with the location of the fair for a time at Milwaukee, we trust, now that the good judgment of the board has been vindicated, they will feel differently in the matter, and again give us their hearty co-operation. When many localities desire the fair at the same time, it is impossible that all should be gratified; some one must of necessity have it, and the others must wait. If any have waited longer already than to them seems just and reasonable, we can only say that the members of the board have acted with an earnest desire to do the best thing for the society and the industrial interests of the state, and have made their decisions with the utmost impartiality. If any who complain will be equally loyal to the great interests involved, all dissension will quickly die out, and the friends of industry throughout the state will be found working harmoniously for its advancement.

Those who have been assigned special duties in connection with this exhibition will hardly need to be assured how important it is that they each perform that duty faithfully and well. Earnestly hoping that nothing will be omitted, and that the results of our further mutual labors will yield the most satisfactory results, I now declare the seventeenth exhibition of the Wisconsin State Agricultural Society open to public inspection.

ANNUAL ADDRESSES.

[The annual addresses were extemporaneous, and since their several authors have not found it convenient to furnish the society with approved copies for publication, we are under the necessity of re-producing them here as originally reported for the Milwaukee dailies.]

ADDRESS OF EX-GOVERNOR SEYMOUR OF NEW YORK.

The Hon. Horatio Seymour, who had repeatedly been invited to address the society, but had been obliged to decline, being on his way home from the region of lake Superior, whither he had gone for his health, was induced to tarry at Milwaukee a day or two for the purpose of visiting the exhibition; which he did on Wednesday, the 27th of September.

He was warmly greeted by the thousands of people present, and at ten o'clock, in response to an urgent request from the officers of the society, made an able and eminently practical speech, of which the following is a substantially correct report :

Ladies and Gentleman: In traveling from my home throughout the great northwestern states, I have been struck not only with the diversity of the agriculture of our country, but also with the great differences in the grade of prosperity which farmers of our country enjoy in different sections. When I left my own home in New York, I left them prosperous, in the enjoyment of foreign markets and all of them engaged profitably in their pursuits, but when I come into this section of our country, blest as it is with soil so fertile and advantages so great, I find a very considerable degree of depression, and the question naturally arises in our mind, Why is this? What makes this difference in the condition of agriculture in different portions of our country.

If we look a little closely into this pursuit, we find that farmers of these United States are always engaged in a perpetual struggle with themselves and Europe for the markets of the world. In this contest, they have the advantage of cheap and fertile lands and of a degree of mechanical skill which has been brought to their aid—advantages unequalled in any other portion of the world, and advantages not paralleled in any period of history. On the other hand we labor under some disadvantages; higher rates of interest and cost of transportation, and dearer labor, and the question is constantly upon the mind of every American farmer how he can shape his pursuits in such form that he can gain the advantage in the conflict which is going on.

When we look to this question a little closely, we find that certain pursuits—certain forms of agriculture—prosper while others do not. Those who are engaged in the dairying business in the eastern states are accumulating fortunes, and such fortunes as always moderate farmers aspire to. On the other hand, as I said before, those who are engaged in the cultivation of wheat do not at this time enjoy that measure of prosperity which has sometimes marked the condition of our country. Now why is this? I propose to inquire into this a little at this time because it seems to me a suitable topic for the occasion.

When we compare our agriculture with that of Europe we find that we have the advantage of cheaper soils, and if we wish to compete with them, we must so shape our industries that we gain the advantage. We find when we attempt to raise garden produce that nine-tenths of the cost of the undertaking is the cost of labor. The cost of the land is a very small per centage of the whole cost. When we attempt to raise cattle for the markets of the world, we find that the cost of land is the great consideration; that the cost of labor sinks in comparative insignificance, for a man can manage in this pursuit a much larger extent of land than in any other pursuit. So we of central New York find when we engage in

the business of manufacturing cheese, that we can cultivate a farm of 200 acres with the same amount of force that is needed out here in the tilling of eighty acres of land. This is the reason that we can send the products of our labor to Europe. We must run our cheap lands against their dear lands, and we should avoid as much as possible running our dear labor against their cheap labor. Therefore, two-thirds of the producers of New York and portions of Ohio and Canada where they are engaged in the dairy business, are prosperously engaged, because they have the benefit of the markets of the world.

In coming to travel through this country, and in meeting farmers who have this question upon their minds, how far they can profitably vary their pursuits, I am frequently asked if this business of making cheese will not be overdone. They have been warned here by some sad experiences, that from time to time many agricultural pursuits that have a passing popularity, have ended in disaster. Such was the result of raising hops in many parts of the west. And there is a natural fear in the minds of farmers in this country, that if they all go into the dairy business they may overstock the market and inevitably fall into the same misfortune. Now I wish to explain to you here why I think that fear groundless, and I beg you will bear with me patiently while I try to make the point clear to you.

The farmers of the west, and part of the east are interesting themselves extensively in the question of diversifying their pursuits. The question of going into the business of dairying as it is conducted in the eastern states, then, is a very important question. In the first place you can do that for the reason I have already alluded to. You run your cheap land against the dearer land of Europe; and another advantage in my judgment of the business of dairying is, that dairy farmers in this country can most profitably engage in competition with the farmers of Europe.

In the first place then you have cheaper lands, and in the next place, the cost of transportation of this product is very

little. When you send a bushel of wheat to New York if perchance that bushel of wheat goes to Europe and sells for a certain price, which we will say will be there two dollars a bushel, you only get about one-half that price in dollars. You lose one-half of the price paid in the great markets of the world. This of course varies with a varying market. When we of Central New York send our cheese to Europe, we find that the price it brings there is not more than ten per cent. more than that given for it at home. In other words, we get for it in England, all but ten per cent. of what it brings.

Then, too, there is another consideration that counts very much in our favor. It is almost the only agricultural product that does not lose its value by the lapse of time. Beef can be raised more profitably in some respects than even cheese can, at home. But then it is an article heavy of transportation. You are obliged to carry it at great cost, and a great deal of it is worthless in the form of brine, barrels, etc. This is not true of our dairies. That is another advantage which you have. You find then that it is not often that a barrel of flour can travel much farther than New York. Sometimes it can travel as far as England, but there it stops. But when we send the products of our labor to Europe, when it gets to England the cost of transportation is so low that the English merchant takes it and sends it to the Mediterranean and Baltic to the persons who are accustomed to use it as an article of food. It is an essential article of food in Europe to a much larger degree than it is in this country. We can make it cheaper than they can, and therefore we can undersell them.

There is another fact I wish to call your attention to, and that is, it is the cheapest food in the world. If you take the nutriment of a pound of cheese and compare it with other food, you will see that it exceeds in nutrition any other article of food. You may sell a pound of cheese for something more than you would a pound of beef, but when you come to New York you will find that a pound of beef costs more than a pound of cheese. Therefore it is of great value to the popu-

lation as an article of food, not only nutritious, but already prepared for use, and poor mechanical people will regard this consideration very highly.

I do not hesitate therefore, to say to you, farmers of Wisconsin, knowing, as I do, the physical character of your land, the diversity of your soil, and the geographical position of it, that you can safely engage in this business; that you need not fear that you will overstock the markets of the world. I think you can in this respect vary your pursuits with perfect safety. In some respects you are the most unhappy people in the world. In the spring of the year you look forward and think it will not be good weather for plowing, then you think it will be ill weather for sowing, and then you watch the skies with the utmost solicitude; and thus all the year round you are perplexed until you have the products of your labor safely housed in your granary, and then you are the most unhappy people in the world before you can decide whether you will sell it or hold on.

Now this unhappy state of mind we escape. We make cheese at our factories; it is sold once in thirty days, and we take what we can get through the year.

There is another great consideration. It is a great matter, as every practical farmer knows, to be able to use your labor equally all the year round. You are now obliged at certain seasons to employ extra hands. But with dairying it is different. The labor of winter is equal to the labor of summer. All members of the family can do something. They can milk or take care of the cattle. And there is another very good thing about it. They not only sell their products at the right time, but they are not obliged to hang around the village tavern all the winter through to learn the price of wheat from the latest advices. I believe I am justified in saying to you, as one who feels a deep interest in the agriculture not only of my own state, but of all the states in the Union—one who at this moment stands before you with a larger idea of this country of ours than he ever had before, that I stand before you full of a

sense of admiration and wonder, and enjoy more than ever doing in a small way what I can to promote its material, and above all, its agricultural prosperity.

There is another point of which I wish to speak, for it determines in a greater or less degree the prosperity of any pursuit. Mere dollars alone will not do it. If we wish agricultural prosperity we must have added to it certain indirect influences. You who live at the east know that all the whaling business of the country is mainly carried on from one or two eastern ports. But there is nothing in the condition of Nantucket or New Bedford which makes them the great whaling ports as mere seaports. Their harbors are no better than they are in a thousand other places. It is no single advantage that any man can point out in the pursuit in which they are engaged. And yet, when we attempted ship-building in New York, on the Hudson, where we had one of the best harbors in the world; there where provisions were cheap, and vessels could be built cheap, we failed. Why? Because there was not that interest felt in the state in the pursuit that gave courage to those engaged in this dangerous kind of commerce. When a man went from the Hudson and attempted anything of the kind, there was no man when he came back to sympathize with him when he told of all that he had undergone. With all of those outside advantages the pursuit went down. But not so with him who sailed from Nantucket and New Bedford. He felt whenever he went to the arctic or antarctic parts of the world, if he stuck and brought in one of the great monarchs of the deep and showed some extraordinary skill, there went a thrill through his heart, for, he said, they will hear of this in Nantucket when he went back home, knowing that they there appreciated his skill and courage.

Now if we want agriculture to succeed in our country, it must not only be made a paying pursuit, but it must interest all of the people, so that it gives dignity and honor to him who shall be foremost as a man of skill and judgment in that calling. The people of England, beyond all others, are fond of ru-

ral pursuits, and a man's dignity and importance is increased if he has a country seat. The Englishman will sell his town house, but never his country house. Beyond all other people they have shown a love for rural life. Right across the channel there is another people who seek that excitement and form of life which they find in cities. But we find that through the whole course of this people it has marked their character and policy.

We find to-day that the principal cause of the peril which threatens France is that when its cities fall its country perishes. We see that Frenchmen despise the country, Englishmen love it, and Americans tolerate the country, but don't love it. We are a people who buy farms, when we can profitably, and sell them again when we think it to our advantage.

In order that agriculture may flourish it should have the sympathy of the people. But the tendency among American people as soon as they accumulate a little means, is to go to the towns, and when they accumulate a little more, to go to the cities, and when they get a little wealth, they go abroad and spend more than \$20,000,000 a year, and that in coin, too, among other people."

The governor referred, in closing, very eloquently to the fact that George Washington, John Adams, Thomas Jefferson, Daniel Webster, and other great and illustrious men were very much attached to rural scenes, and clung with great tenacity to their country homes in the decline of life.

ADDRESS OF HON. HORACE AUSTIN, GOVERNOR OF MINNESOTA.

Governor Austin was happy to be present at one of the greatest fairs ever held in the northwest; happy to see so fine a display of the fruits and results of the industrial efforts of the people of the great state of Wisconsin, and glad to see so great an interest felt in the all absorbing subject of agriculture. But he was strongly impressed with the idea advanced by Gov. Seymour, yesterday, that there is too much of a sameness in the pursuits and occupations of western farmers; that there is

a great want of proper diversity of pursuits among agricultural people of the west; that too many people pursue almost fanatically a single branch of industry, which often causes them to be overtaken by adversity and disaster, when a greater diversity of pursuit might save them from this calamity. This idea is well illustrated by the condition of the people in Mexico, Cuba, South America and other places, where the people follow almost exclusively the single occupation of mining, making sugar, raising cattle, etc. In countries where this exclusiveness prevails, the people are illiterate, poor and squalid generally, whereas in countries or sections of country where a diversity of occupation is found, there education, prosperity and plenty are found. The great reason that the people of England are generally prosperous and happy is that they vary their pursuits in such a manner that in the event of a failure, or overstocked market in one branch, they have other branches to rely upon. But with the western farmer it too often happens that when one crop fails for any cause, he has nothing else to rely upon. This exclusiveness of pursuit is one of the great reasons of the disparity in condition between the western and eastern farmers. While the western farmer enjoys a richer, finer soil, the eastern farmer makes better use of his means and resources, and therefore most frequently excels. It is extreme bad policy, while we are trying to work our livelihood upon our farms to so neglect replenishing the chemical elements withdrawn from them by the removal of crops, as to impoverish and make them barren and unfruitful, so that the next generation will be obliged to spend years of toil and hardship in attempting to reclaim them to their original fertility.

The yield of wheat in the state of Ohio is about 13 or 14 bushels per acre now, while a few years ago it was much greater. In Minnesota for several years past the average yield has been about 20 or 21 bushels per acre. But this year it has been about 17 or 18, partly attributable to the bad season. People are altogether too negligent in saving and

returning to their farms the elements necessary to the growth of the future crops. They burn their straw, waste their manure by building their stables and barns in ravines, where the most valuable portion of the compost is wasted away: or when one place becomes untenable for a barn by reason of accumulations of manure, they move away the buildings and neglect to haul out the manure to enrich the impoverished fields. The waste of valuable manures is one of the most egregious mistakes which the farmer can commit. The chemical elements necessary for growth are removed from the fields in the straw and grain, and very seldom returned. Many of the elements in the kernel are sold when the grain is marketed, and cannot be returned. But care should be taken to replenish the soil as far as possible, to insure the greatest success in farming. Again, farmers too often fail to keep the right kind of stock on their farms. Sheep are the best kind of stock in the world for enriching and reclaiming poor soils. Farmers should keep more and better stock on their farms. As far as mutton is concerned the people in this country keep the poorest sheep in the world. The Englishman who visits this country and dines at the hotels does not call for a plate of mutton any quicker than he would for a piece of roast dog. In England a good sheep is worth as much in the market as a yearling steer. Fineness of wool should not be the great quality sought for. The weight of the sheep, its quality and value for mutton should be taken into account. In England almost every farmer considers a small flock of sheep almost indispensable. We are told that bread alone is not all that is requisite in life. Hence to depend upon raising wheat alone very often brings distress to the homes and firesides of honest, hard working farmers. Last year in Minnesota the people raised abundant crops and were very much elated with the prospect of realizing handsome incomes as the result of their labors. But just about the time that crop was harvested large crops were heard from all over the country. In England, along the Baltic and Black seas, wheat was abundant and the price fell at once

to 50 or 60 cents, in currency, per bushel. In 1860, great crops were raised in Wisconsin and Minnesota, and sold for 50 or 60 cents in gold. And yet people murmured and complained, and all looked forward to the time when they should have railroads, by which to transport their products to better markets. But now, ten years since that time, it is worth less in currency than it was then in gold. Many people had nothing but wheat from which to expect a cent of revenue, a few years ago, and many of them mortgaged their lands and run into debt, and hardly any of them were able to pay their debts, and many of them went through the long cold winters without being able to procure even a new suit of clothes. They hung on to their wheat, waiting for better prices, until at last they were obliged to sell for what they could get, and many were obliged to yield all their crops at last, even at a discount, in order to cancel their old debts.

Many demagogues attribute that state of disaster to the revenue system of the country. But it was a false and fraudulent pretence. If the people had had cheese, beef, pork, wool, mutton, etc., to turn off, it would have saved them from the disaster consequent upon too much wheat raising, and they might have realized fine returns for their labor instead of disaster and ruin.

Another much needed thing is cheap transportation. Much of the net profits of raising grain is pocketed by monopolies and giant corporations organized for the transportation of grain to the markets, so that the farmer is deprived of the greater portion of the profits to be derived from his own labor.

Another thing in the way of prosperity is the want of manufacturing establishments in our midst. There is not a threshing machine manufactured in the state of Minnesota. Probably a million of dollars a year are paid out for agricultural implements, and but a very few are manufactured in the state. The consequence is, that the country is drained of its money, which is carried off to other places, and paid for those things. Every farmer in Minnesota who buys one of Case's threshers,

manufactured in Racine, or others manufactured still further east, pays eighty or ninety dollars freight on his machine besides profits and the cost of the machine. This want of manufacturing enterprises drains the country of vast sums of money.

On the great prairies of Illinois, where some of the finest grazing grounds in the world are met with, the people eat largely of the cattle driven from Texas and intermediate states, while by the aid of a boy and an Indian pony, a vast herd of cattle could be fed and fatted on the prairies of Illinois, and on the hay cut therefrom.

Much of our cheese comes from Orange county, New York, and the Western Reserve of Ohio. This is an abominable state of things.

Something was said yesterday by Governor Seymour about the distaste of our people for agricultural pursuits. It was well said, and I will allude to one or two causes of this condition of things. Among the causes is the fact that the luxuries and comforts, and even the necessities of life are so deficiently provided in the country. Ride through the state and look at the ordinary country homes. Where is the wonder that girls raised in them are anxious to flee to the city, or cotton manufactories of the east? Where is the wonder that the young man will take his departure from them for the city, for the counting room, the lawyer's, or doctor's office? See as you ride through the country, here, there, and almost everywhere, a one-story or a story and a half house with one or two windows in a side or end, a chimney in the middle, with no hall, no pleasant verandas, no parlors, scantily furnished, hardly any books, no pictures, no attention paid to taste or comfort, destitute of a flower garden, and where shade trees are the exception and not the rule, many of them standing on the bald open prairie where they were built twenty years ago, not a tree in sight, unless located by a pond or river accidentally. No wonder there is a distaste for agriculture where such a state of things exists. If you could go and examine the rural condition of the people in England, you would see why it is considered so very desirable and more honorable to leave the city and go to the country.

Let every farmer go home determined to improve on this condition of things. A little flower garden and a grove of trees is almost as contagious as the small pox. The girls in the next house will tease the old gentleman for a little patch for flowers, the next year, and the boys will find time between planting and hoeing to dig up and transplant a few trees, and a new state of things will be inaugurated. If you want to raise trees along the road or in the yard, plow up the ground, break up the sod and make it loose, and mellow, for it is just as essential to do this as it is to break up the ground for corn or wheat crops. Do this and when the eastern man comes along looking for a home to buy, even if your neighbor has a little better soil, he will buy your place in preference, and pay you so much more for it as to return you ten times the cost of beautifying it.

Another thing, do not be so stingy and penurious as to drive your women out forty rods from the house to an old rickety pump or sweep, over a dilapidated well for water, and this too, when the weather is fearfully cold or hot. Do not make them drag wood out from under a great snow bank in winter, and bring it in all dripping and saturated with water, and oblige them to dry it by the fire before they can burn it. Employ help for the women in times of need, and let the girls on the farm see that they are something more than slaves. Do not drive the women to death when the threshers or harvesters are at your place. What is two or five dollars for hired help at such a time?

Commence improving your homes gradually. Do it a little at a time as you can spare the money and the time. Do not mortgage your farms to do this all at once, but improve every opportunity to plant an evergreen here, a flourishing shrub there, to make a flower bed here, and a flower border there; to buy a picture now, and a book at another time, and without knowing that you have made any sacrifice in accumulating wealth, you will soon have pleasant homes, and your children will not desire to leave them for the base allurements of cities and towns.

ADDRESS OF CHARLES SEYMOUR, ESQ., OF LA CROSSE.

LADIES AND GENTLEMEN:—I do not understand the necessity of calling upon a humble printer and editor to come here to be sandwiched in between two live governors of two prosperous and thriving northwestern states. I have merely come forward to tell you that in addition to the remarks of the excellent governor of Minnesota, the governor of Wisconsin will come forward and address you. But if he is not told that this is a meeting of the Wisconsin Agricultural Society, he will come here and talk to you of a ship canal. (Applause.)

This fair is a great success. I congratulate the officers of the society upon the great success which has attended this the largest and most creditable, and most inviting exhibition that has ever been held in the state of Wisconsin. This place has peculiar advantages for such a fair. It is a point at which the manufacturing interests of the state can be largely represented. It is not in this country as in some of the older countries of Europe, where hostile interests exist between the tillers of the soil and those engaged in manufactures. Here in this glorious country they are twin elements of a common strife and a common prosperity. So the agricultural interests and the manufacturing interests are closely blended and intimately identified, and when any man, any politician, any jackass, or any other animal, attempts to alienate those interests or throw firebrands in between them the sooner he is buried the better for the community at large. And yet after all, it is one of the most difficult things on earth to take our public men, those governors, or senators, those congressmen and drill into their heads the idea that there is anything in this country more important than the debating of some abstract question involving the question of straight or curly hair, or locating this or that man in office. But the large, broad, and deep question of all is, the question of cheap transportation in order to get clear of the products of your labor. And so long, farmers of Wisconsin as you do violence to your own profession, so long as you

close the avenues of honor and influence and glory to yourselves or your sons by sending into public stations of life and influence and power men of the professions, or a certain aristocratic position without any knowledge of the industries of the public, so long your interests will be neglected. I would urge upon the farmers of Wisconsin these two points: impress upon every public man for whom you vote the necessity of exerting all the influence he can command for improving the water communications of our country, for enlarging facilities for a cheaper and more economical transportation to the markets, and, above all, teach your public men that in congress, in the legislature, and in the gubernatorial chairs, we want less *gab* and more work. (Applause.)

ADDRESS OF GOVERNOR FAIRCHILD.

Ladies and Gentlemen:—It will be understood that I cannot occupy any great amount of time in telling you what I know about farming. The speakers of yesterday and to-day have told you a great many good things, and I have been very glad indeed to hear the speeches, because I believe they will do us good. They have told us more of what we ought to know about farming than what they know, and that is a subject upon which almost every man in the country can talk. It is the easiest thing in the world to talk, yet a good many things have been said yesterday and to-day, which I believe the people will take home and profit by.

Now, as strange as it may appear to you, I was once a farmer myself, and yet I can tell in three minutes all I know of modern farming, and I think I can tell you in two minutes. In my times we had no threshing machines, no mowers, reapers, plows, or anything of the kind. I remember that we tackled the soil with a big root, and my team was a yoke of oxen and a little old mule, making what we called a spike team. And when we came to thresh our wheat we had no threshing machines, no winnower in the country, and we put it on the ground, built a corral around it and turned in all the hor-

ses, mules, and oxen in the county, and I sat on the fence and threw my socks at them to make them go. Now when I look at this beautiful machinery on exhibition, I envy the farmers here. But I got terribly disgusted with farming in one summer and left it forever and amen. I believe I would have been a farmer to-day, if we had had the facilities for farming and gathering crops when I was engaged in the business, such as farmers enjoy now.

Of all the students in the educational institutions in the state, not one in twenty-five ever intends to till the soil. The very moment you send a young man to college, (I wish to God every young man could go to college), that very moment his mind turns toward the city.

I heard a few days ago at Madison a very interesting paper read by a Dane county farmer, upon the subject of cheese making, as discussed by Governor Seymour yesterday. Every person in the room said who is that? What farmer is that? Well, he proved to be a man past the middle of life, who was a graduate of one of our eastern colleges. There was surprise expressed all over the room that a man with his power of speech, and power of presenting the subject in such a brilliant manner should be a farmer. But it is a disgrace to the American people to be surprised at such a thing. I will tell you how I think we can remedy it somewhat. By lifting up the profession of agriculture above its present level. By making the agriculture of our state the very foundation of our political power in the state. Then as Governor Seymour, or he who ought to be Governor Seymour, said, we will have less *gab* from politicians.

For a great many years I have traveled from town to town in the state and often have to ride on a wagon through the country for miles and miles, and when I go along past a farmer's house I find that in many cases the thresher, or mower, or reaper and drills and plows, are scattered all over the fields. Did any of you ever see it done? [A voice, yes.]

Did you ever know a farmer of that kind to thrive much? [A voice, No.]

And you never will. The first thing the farmer wants to learn in this country is to take care of his tools. And then they will soon learn to take care of everything else, and then they will soon have money to send their boys and girls to school, to ornament their houses, and have flower gardens and everything. And their young men will soon have nice horses and buggies to do their courting with, or to take the girls to Sunday school. (Applause.)

I have a little thrifty garden at home. I cannot hoe any, and I am heartily glad of it; but I do not allow my man to leave the hoe and wheelbarrow out all through the winter.

My friends, I want to congratulate the city of Milwaukee upon the manner they have treated the people of the state. We have all had accommodations. No man has been without a bed if he wanted it. The people have been kind and have thrown open their houses, and the fair has been a great success. I was glad to see our old veterans come on the ground and display the old battle flags. We have to attribute to them some of this success of our country.

I hope next year to see all the people come up and bring their wives and babies. I am glad to see them all here.

I apologize to you for talking so long. [Great applause.]

REPORTS OF SUPERINTENDENTS.

REPORT OF THE HORSE DEPARTMENT.

BY N. S. GREENE, SUPERINTENDENT.

The show of horses at the exhibition of the State Agricultural Society, held in Milwaukee the 26th to 30th of Sept., 1870, although not larger than at former fairs, far exceeded them in the quality of the animals exhibited; showing an advancing interest in our breeders in procuring improved breeds. The horses exhibited, as to breeding, were classed in four divisions, and taken in the order in which they are arranged in our premium list, are, 1st, thoroughbred; 2nd, roadsters; 3rd, horses for general purposes; and 4th, draft horses.

In the class "thoroughbred," the number shown was larger than at former fairs, and of improved quality, but not what I would like to have seen. Most of the stock in this class now here, have been procured for running purposes, and are too small and fine limbed, to breed really useful horses from. The base of all good horse stock is pure blood, the real thoroughbred; and what we need is a larger and heavier boned horse of this kind to breed from. If stallions and mares having these qualities were introduced into the state for breeding purposes, great benefit would result.

In class two, "roadsters," the number exhibited was large, and many of them very highly bred, combining most of the best strains of blood in that class in the world. There were close descendents of the Abdallahs, Mambrino, Hamiltonian, Clays, Pilots, Bellfounders, etc.; many of them direct descendents of Messinger, and highly infused with thoroughblood.

This class of horses is really one of the most important in our state. From them are derived our best trotters, gentlemen's driving horses and carriage teams; nor are they behind

other classes for other uses; they are of sufficient size for farm purposes, and many of them for draft teams. It is evidently for the interest of our farmers to patronize well bred roadster stallions. It costs no more to rear a good colt than a poor one, and when reared, one well bred colt, either for service or sale, is worth two of common blood, and frequently many times more.

In class three, "horses for general purposes," the number on exhibition was not as large as at former fairs. This class of horses is mostly comprised of animals of no known breed, and includes some really good horses, many indifferent and some worthless. It still comprises the largest class on exhibition, but as breeders become more impressed with the importance of improving their stock, the numbers will continue to decrease.

In class four, "draft horses," the number shown was increased, and the quality much improved. There were fine animals of the Clydesdale, Percheron and Norman breeds, the produce of which crossed with our large, roomy, well formed mares cannot fail to make a very sizeable horse, and will at all times command good prices. They are much sought after for heavy teams for the prairies of our state, for cart and dray horses, and for heavy farm teams.

In class five, "jacks and mules," the exhibition was a failure, there being but two pairs of mules exhibited. As this is an important interest in our state, it is to be hoped we may have a better display at our next annual fair.

In class six, the show of matched teams was not large. There were some fine carriage teams exhibited, but nothing like what might have been expected from the location of the fair. There are many fine carriage teams owned at Milwaukee, and in the neighboring towns easy of access, and it is to be hoped that owners will take a sufficient interest to make our next fair more of a success in this respect. The show of matched roadsters was small but excellent, the same of draft teams.

In class seven, "single horses," the show was commendable,

both as to numbers and quality. Many of the horses on exhibition were very fine and valuable.

In class eight, "trotters and pacers," the number of entries was quite large, and much interest was shown by visitors in the races. The arrangements for showing were bad; the track being open on the inside it was impossible to keep it clear. There should have been an inside railing with convenient openings for passing through, which could be closed or guarded during the races. The show of trotting stallions, and mares was fair; many fine and valuable horses contended for the prizes. There was a fair show of trotting geldings and pacers, and a fine show of matched trotting teams.

In class nine, "running horses," the number of entries was large and the horses first class. Great interest was shown by both visitors and exhibitors in the races. The track was in bad condition for running, being quite too hard; but from the nature of the ground, and the large number of teams constantly driving on it, it could not be obviated.

In class ten, "sweepstakes," the show was excellent, and the premium was contended for by a larger number than usual; the stallions, colts, mares and foals were all fine and creditable animals, and made one of the most interesting features of the exhibition.

At the coming state fair, measures are being taken to better systematize the exhibition in this department, and it is hoped, will enable us to escape much of the unavoidable confusion of the last exhibition, and make it more interesting to the public and satisfactory to exhibitors.

REPORT OF THE CATTLE DEPARTMENT.

BY C. H. WILLIAMS, SUPERINTENDENT.

The classes comprising the various breeds of neat stock were well sustained by the farmers of the state. The more prominent breeds, with a few exceptions, were fully represented in point of numbers, and in many instances by very choice and finely bred animals, creditable in the highest degree to their owners, and indicating that the soil and climate of the state are well adapted to producing valuable stock. The Short Horns, as usual, were far more numerous than any other breed; next, in point of numbers, came the Devons; then the Alderneys, and a small representation of Ayrshires. The two last named showing a better class of cattle than have been exhibited heretofore.

In the early days of the state, the larger proportion of our farmers entertained the belief that it would be impossible to make cattle-raising a success, and there are some who—unfortunately for themselves—are of that opinion still. But the gradual, yet very perceptible improvement in this department, at the various annual exhibitions of the society since its organization, and especially the recent fine display of thoroughbred stock, must convince all thinking minds that cattle-raising here can be made profitable, and should in part be the business of all farmers whose lands are, or can be made suitable for the cultivation of grasses.

Breeders of thoroughbred stock have, for the past few years, shown a very commendable emulation, and great enterprise in bringing into the state so many valuable breeding animals. These breeders have done much towards advancing the general prosperity, and it now becomes the duty, as it is the interest of the general farmer to make use of the advantages brought to his door, and proceed without delay to improve his native stock, step by step, until they become paying property, and a credit to the grower, his county and state.

The show of milch cows was meagre indeed (although the

few animals exhibited were good), not such as it should have been when we consider how important and valuable that interest has become. The dairy farmers are not sufficiently alive to their own interest and that of the state, when they neglect to represent themselves in a creditable manner at our annual exhibitions of improved stock.

The exhibition of grade cattle and working oxen was slim in point of numbers, and not as good in quality as it should have been. With the fine show of thorough-bred Short Horns and Devons to be seen at our annual exhibitions for several years back, made up of choice stock from all parts of the state, it would be reasonable to suppose there would be a very large increase of improved grades, and better shows at our annual exhibitions. But it seems our farmers have not fully realized the great benefit to be derived from crossing the native cow with thorough-bred males. For at this time, improved grades are so scarce that persons engaged in stall feeding cattle, are obliged to go to adjoining states to procure suitable stock for feeding purposes, having learned by sad experience that money can not be made by feeding native stock. Thus, it will be seen, that profits which should belong to our home farmers, are, from the necessity of the case, paid over to those in a neighboring state, merely because Wisconsin farmers are not learning the lesson of *progress* as rapidly as their neighbors.

The exhibition of fat cattle was not what it should have been. Those engaged in this paying branch of stock business would do much to encourage the farmer to grow better stock, by showing on these public occasions, a liberal number of their fattened animals.

Farmers of Wisconsin, our interests, and those of our state lie largely in improving all our domestic animals. Growing the best of its kind is the most profitable. Raise then the best only, the best cattle, the best horses, sheep, poultry and swine, if your means will warrant it, if not, go as many steps toward the best as you can, and by a gradual and constant improvement you will in time reach the desired goal.

REPORT OF THE AGRICULTURAL DEPARTMENT.

BY W. W. FIELD, SUPERINTENDENT.

The classes embracing the products of the Field, Garden and Household, have not made so good a showing as could have been desired, yet in the aggregate there has been a fair display. Some twenty fine samples of corn were on exhibition; one sample of which I deem worthy of special mention. It is the red or mixed colored dent, large ears, small cob, deep kernels, and was exhibited by J. J. Pellett, of Oconomowoc. It will be fully tested in 1871, and should it prove what it now promises, will largely increase the corn crop of the state in the future. Forty-five samples of wheat were on exhibition; fourteen of oats, and numerous other farm and garden products. I would mention as worthy of special commendation the large and fine display of field and garden products made by J. C. Starkweather of Oconomowoc, and J. H. Lamberton, of Lamberton; also the very fine exhibition of garden vegetables made by Wm. Gorden, of Kenosha. A very fine showing of potatoes was made by M. K. Young, of Glen Haven, consisting of 149 specimens, for particulars of which I refer to his communication accompanying this report.

The exhibition of the products of the dairy was very creditable; several large cheese factories exhibited choice samples of their cheese. It is hoped that every cheese factory in the state will make an exhibit of their products at all future state fairs. We are fast becoming a great manufacturing state, and it is of vital importance that agricultural products keep pace with other industrial manufacturing interests. Samples of butter shown were very choice; I think I never saw or tasted better, made at any time, or in any country. The display of bread and cake was poor; also jellies and preserves, although the samples shown were choice. It is hoped that the ladies will take more pride in this branch of the department, as it adds largely to its interest and usefulness.

I would urge upon the industrial producers of the state the importance of annually attending the state fair, and exhibiting anything which will tend to advance this great interest. If you do not obtain a premium, you will stimulate and awaken an interest in agriculture, or some other branch of industry which will be felt far and wide. You compare your products with those from other parts of the state; obtain some information which you did not before possess, or impart to others that which will be of benefit to them, and thus the industrial interests will be largely promoted. "He who makes two blades of grass to grow where only one grew before is a public benefactor." In no way can this be better done than by these annual gatherings, where the experience and results of private enterprise are brought together, comparisons made, and the benefits of this interchange of views and of diversified industry spread before the people of the state.

NEW VARIETIES OF POTATOES.

M. K. YOUNG'S REPORT.

According to promise I have the honor herewith to report upon the 149 varieties of potatoes I had on exhibition in your department of this year's state fair at Milwaukee.

The White Rose—named at the state fair of 1869 by Dr. John A. Warder of Cincinnati—is a hybrid of my own propagation from the Early Rose and Early Hansworth. The history of its many tests in different localities during the past season, though an unusual hard one on all varieties, has given great satisfaction. In instituting these tests, much care was exercised in intrusting them to gentlemen of reputation for their critical knowledge of the subject as a specialty, so that whatever its claims to merit might be, they would be established beyond question. The reports of these gentlemen, together with developments at digging-time in my own patch, have not only confirmed but augmented the high estimate I placed upon this variety when on exhibition at the state fair. When I came to dig the White Rose I found one hill (I planted one eye to the hill) the potatoes of which weighed 14 lbs. 11 oz., another hill 13 lbs. 12 oz.; the former had two stalks to the hill, the latter but one stalk. Mr. Burras of Ohio got nearly a bushel from one potato, about half the eyes failing to grow. Mr. Grinnell of Iowa got over a bushel by measure from one potato: calls it bug-proof, saying, "its vines were not touched by the bugs, while those of one hundred and twenty-one other varieties were nearly all destroyed." He had all the crack

kinds, including "King of the Earlies," "Early Rose," "Climax," "Early Mohawk," "Peerless," etc., and pronounces it "ahead of all others." George W. Campbell of Ohio, the originator of the Delaware grape, calls it "handsomer in color and shape than the Early Rose, and in quality fully equal." These things having been said of the White Rose, in such a season as the past, by such authority, in addition to what I have known of it the last two years, I readily dismiss all further solicitude about the fate of an enterprise in which I acknowledge I have had some pride.

The King of the Earlies.—This is the famous potato that in the spring of 1869 sold for \$100 per pound, or \$50 for a single tuber. It is a seedling of the Garnet-Chili, and is the very earliest of productive habits of any variety known; but after all its early prestige and costly history, it is questionable whether it will supersede to any great extent outside of city market gardens its kindred worthy, the Early Rose. It is a poor seeder, having but few eyes, a particular in which the Rose excels. The rate of reproduction, however, is respectable as may be seen from my own experience with it. In 1869, from two eyes I got about sixteen-pounds from which I grew nine bushels the past season.

The Early Rose.—This is also a seedling from the Garnet-Chili and is too generally known to demand a word from me. But as an early potato it has great and unusual merits; among them, long keeping, even up to the new crop, an inveterate resistance to demoralizing influences after being stored, such as light, heat and continued sprouting. The only thing that can be said against it, is a little proneness to rot when planted late, and its foliage being rather a favorite with the Colorado potato bug.

The Peerless.—This, as the two-last, is a seedling of the Garnet Chili, and from the same propagator, Mr. Breese. It is a late grower, good yielder, and good table quality. It has a large amount of foliage, which is particularly relished by the potato-beetle; the tubers grow very large—too large on rich soil to be grown many years without becoming hollow. The tubers of this variety are monsters in size. One of them I have on exhibition of this year's growth, which weighed when dug four pounds five ounces, and developed, after one main bulb of two or more pounds weight, nine distinct additions, making it look like anything but a "form of beauty."

The Prolific is also a seedling of the Garnet Chili, by Breese. It is a strong, good yielder, and well shaped potato, and has met with great favor in some parts of the east.

The Climax is a seedling of D. S. Heffron, from the early Goodrich. This variety is a strong grower, good yielder, and from its results this season in connection with the drouth, I am inclined to allow it rather renewed confidence among the earlier kinds.

The Excelsior is Mr. Gregory's favorite; a long keeper and extra table potato.

The Willard is Mr. Gregory's pet seedling, from the early Goodrich. It

is a strong grower; productive, very uniform in shape, with rare shipping qualities.

The Early Mohawk is Conover's rival of the Early Rose. It is a strong grower, good yielder, of good table quality, not quite as early as the Early Rose, not as susceptible or sensitive to physical changes; I think a better shipper. In other respects must drop the comparison for want of conclusive evidence; under the impression, however, that for years each will have its special and worthy champions, and time alone will have to declare the umpirage between two of the best *early* potatoes of the last decade.

Time and space barely allow me to add the Early Snow-ball, Granite State, Pride of Duchess and New Hampshire Seedling, as new and promising varieties.

The soil used in my culture of these kinds has been very uniform in character, consisting of a deep, vegetable loam, manured to the extent of practicable fertility, having in view the greatest yield, rather than the finest table quality.

In conclusion, I must express the satisfaction I feel in the fact that the third, if not the second in importance, of food-producing plants for the human family, has had so many valuable varieties added since the days of Dr. Goodrich, of productive vigor and good keeping qualities.

REPORT OF THE DEPARTMENT OF MACHINERY.

BY RUFUS CHENEY, SUPERINTENDENT.

In presenting a report of the department of machinery, permit me to say that it is a difficult task to preside over this department satisfactorily on account of its great and diversified array of machinery and implements; and that it is no less difficult to make a report upon the articles exhibited in it in a manner readable to the agriculturist, serviceable to the society and agreeable to the exhibitor.

The rapid development of machinery to facilitate farm and domestic industry is the pride and glory of our rising state. The improvement in farm machinery during the past five years is most wonderful, and speaks in flattering terms of the genius of inventors, the skill of mechanics and the just appreciation of the public.

The great display of agricultural machines on the ground is worthy of especial notice; and the only regret the superintend-

ent entertains is the want of time to specially notice all the meritorious machines. The most he can do is to group them together and call attention to the principal ones.

Reapers.—Of the large list of reapers on exhibition the following may be noticed as among those having built up a reputation in agricultural communities:

Esterly's new self-raking reaper and mower combined. The workmanship and neatness of finish of this machine justly attracted much attention, particularly the positive action of the rake, which is held firmly in its place by iron fixtures in every position it assumes.

Walter A. Wood's self-raker and reaper combined with mowing attachment. This machine has lately been improved so as to work more perfectly in short or heavy grain. It has long been in use in the west, and has a well-founded reputation.

Williams' Combined. This is apparently a new machine, provided with the Johnson rake.

The Cayuga Chief is well known in many places in the west, and has some peculiarities. It is built with Wheeler's self-rake and also has a dropper.

The Kirby is of old repute and has been long and favorably known to western farmers. Also the Burdick machine.

Sweepstakes. A machine that has been on trial a few years in the west and which seems to attract much attention. It is supplied with the "Butterfly" reel-rake.

The Dodge is a seemingly light machine, and one likely to win favor. It has lately been introduced in the west, and is provided with flexible bar reel-rake.

Excelsior. This machine has long been in competition for western favor. It has lately been subjected to several changes and is now made with overhanging reel and dropper attachment, and also reel-rake.

John P. Manny's combined reaper and mower is one of the original harvesting machines introduced in the west. It has undergone many changes since its first triumph, and now ap-

pears with overhanging reel and rake attachment, being adjustable so as to suit various heights of grain.

The Marsh Harvester. This machine has a feature not possessed by any other machine on exhibition. It has an overhanging reel and carries the grain by means of a canvas, to two persons who ride on the machine, and who bind the bundles while the machine is in motion.

The Ætna is a new candidate for popular favor among the farmers. It is provided with reel-rake, also with dropper.

Climax reaper and mower combined has been several years on trial and has met with flattering success. It has a sweep-rake with quadrant platform.

Little Champion. This machine is of somewhat recent production. It presents a neat and tasty appearance, and is provided with reel-rake.

New Yorker. This is one of the "old settlers," and was among the first to use the self-rake and quadrant platform. It has lately undergone several improvements with a view of making it lighter, etc.

The Clow reaper is a Wisconsin production. It has its friends, and is on the list of competitors.

The Beloit reaper has for several years been known to the public, and now ranks among the first class machines. It is now a self-raker.

The Onondaga Chief is comparatively a new machine in the west. It presents some fine points in appearance.

It is much to be regretted that the "Automatic Reaper and Binder," invented by S. D. Carpenter, one of our own citizens, was not on exhibition. The favorable reports in circulation of its performance in the field, has created quite an interest in it among our grain growers.

Mowers.—There was a large number of mowers on the ground, all of which have their friends. Among the most prominent seems to be the Walter A. Wood's, Economy, the World, the Ætna, Yankee Mower, John P. Manny's, the Excelsior, Dodge, Little Champion, Esterly, Clipper, Climax,

Onondaga Chief. The above machines all possess much merit, but the degree of perfection which one has over another is left to the appreciative judgment of the public.

Drills and Broadcast Seeders.—The list in this department is large, and it cannot be expected that more than a passing notice should be given here. The list embraces, Esterly's Broadcast Seeder and Cultivator, Buckeye, Lake Mills Seeder, Manny's, Hayden, Rood & Co., Rowell's Seeder, The Farmer's Friend Drill, also Seeder, and Van Brunt's.

The Esterly and Buckeye machines were most elegantly finished.

Plows and Cultivators.—The display in this department was quite large and very creditable. Mr. W. F. Whitney of Milwaukee, had a fine display. A gang plow, by H. S. Perry of Buffalo, N. Y., attracted considerable attention. O. W. Jones of Columbus, Wis., exhibited a device for equalizing the draught for three horses, which seemed to possess some merit. The Madison Manufacturing Co. had several highly wrought cultivators. L. J. Bush of Milwaukee, exhibited a fine lot of plows from Dixon, Ill. Collins & Co. of Hartford, Conn., were represented by three of their celebrated plows. Several varieties of iron cultivators and shovel plows were exhibited by W. H. Whiting.

A new and ingenious corn harvester was exhibited by Bergen, Hunt & Co. of Twin Grove, Wis. The machine is operated by two men and a boy, drawn by one horse, and is designed to cut and set up the corn. This machine seems worthy of encouragement.

Horse Rakes.—Of these there were a large number and considerable variety. Among the most prominent was Coat's Lock Lever, Henderson's Improved, the Taylor, the Sulky Rake, Buffalo New York, Buckeye, Keystone, and Meadow King, all of which rank high in the claims of farm interest.

Hay Tedder.—A new and ingenious device for a hay Tedder came from the Richardson Manufacturing Company, of

Worcester, Massachusetts, attracted much attention for its free, simple motion.

Threshers and Horse Powers.—In this department there was a splendid display. J. I. Case exhibited two of his well-known threshers and separators, with steam power, portable engine, etc.

There was also two of the Geiser threshers and separators. This machine presents the novelty of dispensing with the ordinary sieves to separate the grain. It was driven by the Ames engine, ten horse power.

A new candidate for favor was the Dexter thresher and separator; also Badger Boy. Several kinds of horse powers were exhibited. The well known Pitts and Woodbury, mounted on two and four wheels. Also the Champion, designed for sawing wood etc.

Farm Wagons.—There were several farm wagons, some of most excellent finish, one of which was provided with a box for side dropping, which elicited considerable attention. Carpenter's patent coupling seemed to merit special notice, as it dispenses with nearly four-fifths of the blacksmith work on the wagon, and is claimed as a demonstrated success.

Bobbs.—Kuhn, Seiberling, of Canton, Ohio, exhibited two specimens of bobbs, with iron knees and flexible joints etc.

Cider Mills.—The display in this line was very creditable, embracing the usual plan of crushing the fruit and expressing the juice.

Corn Planters.—The corn planter of Elyria attracted much attention, and it appears to be entitled to consideration, but being new and untried in this locality its permanent success must rest on practical experiments.

Corn Shellers.—Of these implements there were several varieties, all of which merited their share of attention.

Fanning Mills.—This indispensable agricultural implement was fully represented by two varieties. The A. P. Dickey

mill, of Racine, and the Defiance, of Dayton, Wisconsin. The former appeared in both a single and double capacity. The double especially adapted to ware houses, grist mills, etc.

Straw Cutters.—A large variety were on exhibition which contributed largely to juvenile sport in testing their chopping virtues. The Eagle, Burdick, National, Pierpoint and Stevenson's Changable Cut; German improved, Telegraph Feed, etc., being the most prominent.

Water Wheel.—The new Houston Turbine, of Beloit received much attention by mill owners and others. It claims to possess many superior advantages. The American Turbine of Dayton Ohio, also was on exhibition.

Force Pumps.—Carver's double acting force pump seems to be very desirable, as it is a very easy acting pump. It is especially designed for deep artesian wells and seems worthy of the highest consideration. W. G. Hamilton exhibited a novel plan of raising water from common wells that deserves notice. A. D. Gates of Oshkosh exhibited a self acting force pump of considerable merit.

Grist Mills.—Boyer and Bro., of Philadelphia, exhibited a farm grist mill of simple construction, which is worthy of attention. The Ingham or California Smutter claims some peculiar advantages. The Challenge Feed Mill, of Batavia, is worthy of mention.

Miscellaneous.—Goodyear's Hub Turning Machine is a new and useful device for turning wagon hubs. It was in operation and seemed to give good satisfaction.

Frank & Co., of Buffalo, N. Y., exhibited a Pony and Panel Planer, both in operation, giving good satisfaction.

H. Woodward, Milwaukee, exhibited a new and useful machine for sawing fire-wood, by means of a saw attached to the crank of a balance wheel. It seemed quite efficient and useful.

John E. Smith, of Buffalo, N. Y., exhibited a revolving sausage cutting machine with four knives and a turbine hoop.

It slowly revolves by a ratchet, thus insuring an even and uniform cut of the meat.

A saw swedge by Eaton & Co., of Milwaukee, seemed to be a useful device for swedging saw teeth, to prevent them from clogging.

An upright six-horse power portable engine with boiler seemed both cheap and useful.

B. F. Sturtevant, of Boston, Mass., exhibited a very neat and effective pressure blower for blast furnaces, &c.

A large number of washing machines were exhibited of more or less merit.

Henry Meyers, of Grafton, Wis., exhibited a chair seating machine, which was operated to the delight and satisfaction of all observers.

The Babcock and Excelsior fire extinguishers were on exhibition, and each extinguished a conflagration. Both acquitted themselves with credit.

Bowden & Calkins, of White's Corners, N. Y., exhibited a tire upsetting machine that promises well, and was generally commended.

The above comprises the greater portion of the machinery under the charge of your superintendent.

Our country has been made what it is by the genius and ingenuity of inventors and artizans, and it is not only right, but befitting that this ill-paid class of useful men should receive at least a fair recognition on the part of those most benefited by their skill and industry.

That many unworthy and even frivolous machines are offered to the public, by no means affords an excuse for disregarding all new inventions. For all the most useful machines now in use were once *new*, and received their share of abuse as humbugs, &c. It is rather a subject of congratulation that so few useless machines are exhibited to the public, in comparison with the great number of vast utility.

In order to stimulate competition a contest must be had. How many horses of speed would attend our fairs, if they were

only to be hitched to a post to be looked at, without being tested?

In New York, Ohio, and the superintendent believes in other states, a preliminary trial is ordered, at some convenient center for all harvesting machines. The results and awards are reported at the subsequent state fair. This feature is strongly recommended in our state. It will stimulate competition and our farmers will reap the benefit. Let the competition be open to all the world, and to every kind of machine and the *merit* be decided on the general result as to cost of machine, draught, cost of harvesting a certain amount, etc., etc. Where there is no strife there is no glory and no incentive to excel, since the poorest stands an equal chance with the best. Let committees be unknown to the world till the hour of trial, and this will prevent all suspicion of tampering with the judges, who should be selected because they are experts, without reference to locality or other considerations. This method has been adopted by the St. Louis fair board in their management, and with the happiest results. Scarcely a complaint is ever heard. The amount of premium is not of so much consequence as the circumstances connected with its bestowment.

The conferring of the "Cross of the Legion of Honor," on Mr. Wood, by the French empire, a mere bauble, intrinsically considered, was a more lasting benefit to the recipient, than a \$10,000 cash premium; not because it came from the hands of an emperor, but because of the dignity and impressiveness of the circumstances of its presentation. While the superintendent is in no mood to recommend the Society to copy from any crowned head, yet the circumstances may afford us a lesson both entertaining and profitable.

The governor of our state is the highest officer of the people's choice. Let suitable emblems be presented by his and other official hands, accompanied by proper words of cheer to successful competitors, and there is no doubt the interest of our annual fairs would be increased an hundred fold, to say nothing of the increase of receipts.

In concluding this report, permit me to suggest that we should call to our aid any and all who will in any way increase the interest to the exhibitors, and attract the people to our annual gatherings.

Let such devices and emblems, not too expensive, be procured and placed at the disposal of competent judges as will be attractive and complimentary to those who receive them. Thus at each returning fair will be found new attractions, increased interest and enlarged receipts.

REPORT OF THE FINE ART DEPARTMENT.

BY J. O. EATON, SUPERINTENDENT.

The fine arts hall, a building 45 x 100, with a wing 35 x 50 feet, was not strictly limited in its use to works of art, but was filled to its fullest capacity, with an extensive variety of articles, which for art, workmanship, ingenuity, beauty and usefulness, could not well have been excelled. Any attempt to describe either singly or collectively, the numerous articles on exhibition, would convey but a faint idea of the many attractions which met the eye of the visitor. The constant rush of people passing through the hall, from the opening until the close of the fair, clearly indicated the attractiveness of the exhibition, and a corresponding appreciation on the part of the public.

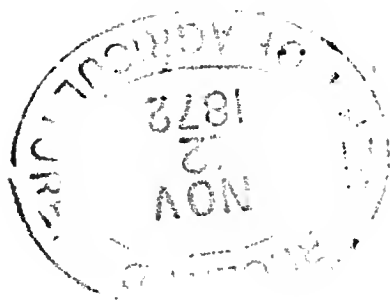
The society is under special obligations to Mrs. Alexander Mitchel, for the generous offer of her entire collection of works of art, for the occasion; from which we selected a large number of fine paintings, of an aggregate value of not less than fifty thousand dollars; also to Messrs. H. N. Hempstead, for the use of Chappel's celebrated picture known as the "last hours of President Lincoln." This painting with its superbly carved black walnut frame, is said to have cost twenty thousand dollars, and was one of the most attractive features of the exhibition.

Messrs. John Nazro, James Ludington, G. W. Allery, R. H. Adams, G. B. Goodwin, E. T. Mix, F. A. Lydston, W. A. Nowell, C. Andrews, F. J. Blair, E. R. Persons, J. F. Bird, J. A. Bucha, Rev. Mr. Allison, and many other citizens of Milwaukee, contributed valuable paintings from their private collections.

Added to all these, were the works of Vianden, Verbryck, Lydston, and other celebrated artists, which were in competition for premiums, making collectively the most extensive, valuable and finest collection of works of art, ever exhibited in Wisconsin.

To F. A. Lydston and W. A. Nowell, assistant superintendents, for their untiring efforts in making the exhibition a success, and to those gentlemen who so freely contributed, and assisted in putting their contributions in place, the society is under lasting obligations.

It is hoped that the success attending their efforts, will stimulate others at subsequent fairs, to imitate their example.



REPORTS OF COMMITTEES AND AWARDS OF PREMIUMS.

HORSES, JACKS AND MULES.

Class 1.—Thoroughbreds.

Best stallion, 4 years old and over, John Ross, Mineral Point, "Canada".	\$50
Second best stallion, 4 years old and over, John Corrigan, Cedarburg,	
" Hazard "	20
Best brood mare, 4 years old and over, R. Richards, Racine.....	30
Second best brood mare, 4 years old and over, R. B. Cutting, Darlington.	15
Best filly, 3 years old and under 4, Lawrence Mooney, "Mequon".....	10
Best filly, 1 year and under 2, Wm. Ormond, Milwaukee.....	6

The committee were highly gratified to find so large a number of good horses on exhibition in this class, and were much pleased to see such evidence of improvement in this class of stock in our state. They found the duty of deciding upon the merits of the animals, especially the stallions, exceedingly difficult to perform. Among these, were three fine-bred entries, of equally good pedigree—"Canada," "Hazard," and "Twenty Cents." The first two, half brothers, by "Lexington," with dams of unquestioned purity; the third equally good as to his genealogy. In forming their decision the committee took into consideration the appearance and performances of the animals, and were induced by the large and fine appearance of "Canada," his brilliant performances and his pedigree, etc., constituting everything that makes a first-class, thoroughbred horse, to award him the first premium.

C. LOFTUS MARTIN,

C. H. PHILLIPS,

N. D. WILLIAMS,

Committee.

Class 2.—Roadsters.

Best stallion, 4 years and over, George C. Stevens, Milwaukee, "Bald Chief"	\$50
Second best stallion, 4 years old and over, C. T. Bradley, Milwaukee....	25
Best stallion, 3 years old and under 4, Henry Phillips, Merton, "Black Bashaw"	20
Second best stallion, 3 years old and under 4, W. L. Wells, Lodi, "Badger Boy"	10
Best brood mare, J. L. Mitchell, Milwaukee	30
Second best brood mare, R. Richards, Racine, "Fanny"	15
Best filly, 3 years old and under 4, S. B. Davis, Milwaukee	10
Second best filly, 3 years old and under 4, George Shaw, Rubicon.....	5

In the opinion of the committee, so large a display of good horses has never been shown at any of our State Fairs, as was on exhibition in this class. They believe the two brood mares, receiving the first and second premiums, are two of the best mares they have ever seen in the west. Having but two premiums to bestow we felt satisfied that we could not do justice to half the stock shown, and after much deliberation awarded the premiums as above.

C. LOFTUS MARTIN,
C. H. PHILLIPS,
N. D. WILLIAMS,
Committee.

Your committee, to whom was assigned the duty of examining Classes 3, 4 and 5, would respectfully report the following entries, as in their judgment entitled to the premiums offered.

Class 3.—Horses for General Purposes.

Best stallion 4 years old and over, W. L. Orvis, Fox Lake	\$30
Second best, Jas. Douglas, Lake Mills	15
Best stallion 3 years old and under 4, F. Esch, Milwaukee	10
Best stallion 2 years old and under 3, Simon Ruble, Beloit	8
Second best, C. T. Bradley, Milwaukee	4
Best stallion 1 year old and under 2, Samuel Perry, Lake Maria.....	6
Second best, B. Fuller, Milford.....	3
Best sucking stallion colt, S. B. Davis, Milwaukee.....	4
Second best, R. Richards, Racine.....	2
Best brood mare, C. T. Bradley, Milwaukee	20
Second best, S. B. Davis, Milwaukee	10
Best filly 3 years old and under 4, J. L. Mitchell, Milwaukee.....	10
Second best, C. T. Bradley, Milwaukee	5
Best filly 2 years old and under 3, E. M. DePuy, East Troy	8
Second best, J. L. Mitchell, Milwaukee	4
Best filly 1 year old and under 2, C. T. Bradley, Milwaukee.....	6
Second best, E. M. DePuy, East Troy.....	3
Best sucking mare colt, Simon Ruble, Beloit	4
Second best, Simon Ruble, Beloit	2

Class 4.—Draft Horses.

The exhibition in this class was large and very creditable. Among so many animals, differing little in merit, the duties of the committee were arduous and perplexing, but they have endeavored to discharge them to the best of their ability.

Best stallion, 4 years old and over, Simon Ruble, Beloit.....	\$30
Second best, Thos. Bowles, Janesville	15
Best stallion, 3 years old and under 4, Michael Jordon, Greenfield.....	10
Best brood mare, 4 years old and over, Simon Ruble, Beloit.....	20
Second best, E. M. DePuy, East Troy.....	10
Best filly, 3 years old and under 4, Simon Ruble, Beloit.....	10



“BALD CHIEF.”

Sire Bay Chief, by Mambrino Chief; dam by Hunt's Commodore, s. d. by Hunt's Highlander, s. s. d. by Potomac. Bred in Kentucky. Now the property of George C. STEVENS, Milwaukee, Wis. (Bay Chief, at five years, trotted a half mile in 1 min. 8 sec., and soon thereafter was killed by guerrillas.)

Class 5.—Jacks and Mules.

Best pair working mules, J. W. Park, Dodge's Corners.....	\$10
Second best, David Donnan, East Troy	5
Best single mule, W. L. Dougherty, Darlington.....	6

GEO. A. WINTON,
C. J. SIMMONS,
E. N. SHELDON,
Committee.

Class 6.—Matched Horses and Mares.

Best pair of carriage horses or mares, Levi Blossom, Milwaukee.....	\$30
Second best, T. B. Rowland, Genesee	15
Best pair roadsters, J. C. Owen, Footville ...	30
Second best, G. Adams, Racine	15
Best pair of farm or draft horses or mares, Sam. A. Fox, Waukesha....	30
Second best, Henry R. Savage, Merton....	15

The number of carriage horses and roadsters in this class was large, but only four pair of each appeared before the committee. The display of farm teams as a whole was most excellent.

E. ENOS,
V. DETERING,
A. STONE,
Committee.

Class 7.—Geldings or Mares for Single Harness, Saddle, Etc.

Best for single harness, 4 years old and over, C. P. Silvernale, Waukesha,	\$10
Second best, J. L. Durthrick, Spring Prairie.....	5
Best for saddle, 4 years old and over, K. S. Torrey, Pleasant Prairie....	10
Second best, J. I. Case, Racine.....	5

E. ENOS,
V. DETERING,
A. STONE,
Committee.

The committee of judges for classes 8 and 9, report the following awards:

Class 8.—Trotters and Pacers.

Best and fastest trotting stallion, over 5 years old, John Corrigan, Cedarburg, "Kemble Jackson," time 2:49 $\frac{1}{4}$	\$100
Second best, W. L. Wells, Lodi, "North Hawk,"	50
Best and fastest trotting mare over five years, W. D. Edgerton, Beaver Dam, "Capitola," time 2:36 $\frac{1}{2}$	60
Second best, E. D. Rood, Milwaukee, "Ida"	30
Best and fastest trotting gelding over 5 years, H. W. McAfferty, Columbus, "Bruiser," time 3:06	20
Second best, E. D. Rood, Milwaukee, "Long Branch"	15
Best and fastest trotting matched span over 5 years, Simon Anderson, Milwaukee, time 2:39	25
Second best, M. F. Cutting, Racine, time 3:33	15
Best and fastest pacing horse or mare, J. C. Owen, Footville, time 2:41 $\frac{3}{4}$	30
Second best, E. B. Greenleaf, Milwaukee	15

Class 9.—Running Horses.

Two mile heats, best 2 in 3, Dan'l. Hauver, Monroe, "Limerick Boy," time, 1st. heat 3:43 $\frac{1}{4}$ —2d heat 3:45 $\frac{1}{4}$	\$200
Second best, J. B. Cutting, Darlington, "Twenty Cents"	\$100
Mile heats, best 3 in 5, J. B. Cutting, Darlington, "Twenty Cents," time 1:49—1:51 $\frac{1}{4}$ —1:51 $\frac{1}{2}$	100
Second best, John Ross, Mineral Point, "Canada"	50
Colt race, mile dash, John Corrigan, Cedarburg, "Williamsport," time 1:53.....	50
Second best, L. Mooney, Mequon, "Kitty Karson"	25

WM. HOBKIRK,
C. H. LARKIN,
A. H. PHILLIPS,
Committee.

Class 10.—Sweepstakes on Horses.

Best stallion and five of his colts at 4 years of age or under, in harness or not, at the option of the owner, Simon Ruble, Beloit, Grand Silver Medal and.....	\$100
Best brood mare, to be shown by the bridle, with foal by her side, Sim- on Ruble, Beloit, Grand Silver Medal and.....	50

P. F. GALLAGAN,
C. H. PHILLIPS,
JOHN STRACHAN,
Committee.

CATTLE DEPARTMENT.

Class 11.—Short Horns.

Best bull 3 years old and over, J. Athearn, Oshkosh	\$50
Second best, Wm. Rhodes, Salem Station.....	25
Best bull 2 years old and under 3, Hart Bros., Milwaukee.....	20
Second best, E. & J. Smith, Rochester	10
Best bull, 1 year old and under 2, E. P. Brockway, Ripon.....	8
Second best, J. C. Meacham, Genesee.....	4
Best bull calf, E. P. Brockway, Ripon.....	6
Second best, E. P. Brockway, Ripon.....	3
Best cow, 3 years old and over, E. P. Brockway, Ripon.....	40
Second best, E. P. Brockway, Ripon.....	20
Best heifer, 2 years old and under 3, E. P. Brockway, Ripon.....	20
Second best, E. P. Brockway, Ripon.....	10
Best heifer, 1 year old and under 2, E. P. Brockway, Ripon.....	8
Second best, E. P. Brockway, Ripon.....	4
Best heifer calf, E. P. Brockway, Ripon.....	6
Second best, E. P. Brockway, Ripon.....	3

The foregoing awards were made conscientiously after careful examina-
tion of the several animals in the ring. The *animals alone* being considered
in arriving at our conclusions. Most of the stock examined was of superior
merit, and quite a number of animals aside from those receiving the awards
were worthy of commendation.

E. M. DANFORTH,
I. H. HICKS,
GEO. WILLEY,
Committee.



JERSEY BULL "HEAVY,"

At two years of age.

Awarded the First Premium at Wisconsin State Fair of 1870. Owned by C. C. & R. H. Parks, Waukegan, Ill.

The committee on Devons, Alderneys and Ayrshires, although gratified on account of the number and superior quality of the animals on exhibition, found that it seriously embarrassed them in forming their decision as to the respective merits of the animals presented, but after careful consideration report as follows:

Class 12.—Devons.

Best bull, 3 years old and over, L. Rawson, Oak Creek	\$40
Second best, Stephen Warren, Hartland.....	20
Best bull, 2 years old and under 3, L. Rawson, Oak Creek	20
Second best, L. Rawson, Oak Creek	10
Best bull, 1 year old and under 2, L. Rawson, Oak Creek	8
Best bull calf, L. Rawson, Oak Creek.....	6
Second best, L. Rawson, Oak Creek.....	3
Best cow, 3 years old and over, L. Rawson, Oak Creek.....	30
Second best, L. B. Potter, Wauwatosa	15
Best heifer, 2 years old and under 3, L. Rawson, Oak Creek.....	20
Second best, L. Rawson, Oak Creek	10
Best heifer, 1 year old and under 2, L. Rawson, Oak Creek.....	8
Second best, L. Rawson, Oak Creek	4
Best heifer calf, L. Rawson, Oak Creek	6
Second best, L. Rawson, Oak Creek.....	3

Class 13.—Alderneys.

Best bull, 3 years old and over, C. C. & R. H. Parks, Waukegan, Ill....	\$40
Second best, C. B. Durand, Racine	20
Best bull, 2 years old and under 3, C. T. Bradley, Milwaukee.....	20
Best bull calf, C. C. & R. H. Parks, Waukegan, Ill.....	6
Second best, C. B. Durand, Racine	3
Best cow, 3 years old and over, C. C. & R. H. Parks, Waukegan, Ill....	30
Second best, C. B. Durand, Racine.....	15
Best heifer, 2 years old and under 3, C. T. Bradley, Milwaukee	20
Best heifer, 1 year old and under 2, C. C. & R. H. Parks, Waukegan, Ill.	8
Best heifer calf, C. B. Durand, Racine	6
Second best, C. C. & R. H. Parks, Waukegan, Ill.....	3

Class 14.—Ayrshires.

Best bull, 3 years old and over, J. Stoddard, Greenbush.....	\$40
Second best, C. B. Durand, Racine	20
Best cow, 3 years old and over, C. B. Durand, Racine.....	30
Best heifer 1 year old and under 2, C. B. Durand, Racine.....	8
Best heifer calf, C. B. Durand, Racine	6

JAS. McWILLIAMS,
N. D. FRATT,
E. O. RUDD,
Committee.

The committee on grade cattle, milch cows and fat cattle find the exhibition in these classes very meager, but report the following as worthy of the premiums offered:

Class 15.—Grade Cattle and Working Oxen.

Best grade cow, 3 years old and over, B. Brazee, Wauwatosa	\$10
Second best, E. & J. Smith, Rochester	7
Best heifer, 2 years and under 3, E. & J. Smith, Rochester	5
Best yearling heifer, B. Brazee, Wauwatosa	8
Second best, E. & J. Smith, Rochester	4
Best yoke working oxen, T. B. Hart, Wauwatosa	20
Second best, T. B. Hart, Wauwatosa	10
Best yoke 3 year old steers, L. Rawson, Oak Creek	12

Class 16.—Milch Cows.

Best milch cow of any breed, E. & J. Smith, Rochester, Silver Medal and	\$20
Second best, M. L. Butterfield, Waukesha	Bronze Medal and 10

Class 17.—Fat Cattle.

Fat cow, steers or heifer, E. & J. Smith, Rochester, 2d premium	\$3
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The committee awarded the 2d premium to the entry in class 17 on account of there being no competition, and there being other cows on the grounds superior in this respect.

B. FERGUSON,
CHARLES LYLE,
H. H. POTTER,

Committee.

Class 18.—Herds.

Best bull and 4 cows or heifers, 1 year old and upwards, E. P. Brockway, Ripon	Grand Silver Medal and \$50
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E. M. DANFORTH,
BENJ. FERGUSON,
JAS. McWILLIAMS,

Committee.

SHEEP.

Class 19.—American Merinos.

Best buck, 2 years old and over, J. H. Paul, Genesee	\$20
Second best, J. H. Paul, Genesee	10
Best buck, 1 year old and under 2, David Donnan, East Troy	10
Second best, J. H. Paul, Genesee	5
Best pen of 3 buck lambs, J. H. Paul, Genesee	8
Second best, O. Cook, Whitewater	4
Best pen of 10 ewes 2 years and over, L. Eastman, Kenosha	30
Second best, J. H. Paul, Genesee	15
Best pen of 3 ewes, 2 years and over, A. E. Perkins, Mukwonago	20
Second best, J. W. Park, Dodge Corners	10
Best pen of 10 ewes, 1 year old and under 2, J. H. Paul, Genesee	20
Second best, O. Cook, Whitewater	10
Best pen of 3 ewes, 1 year old under 2, J. W. Park, Dodge Corners	10
Second best, J. W. Park, Dodge Corners	5
Best pen of 10 ewe lambs, J. H. Paul, Genesee	20
Second best, J. W. Park, Dodge Corners	10
Best pen of 3 ewe lambs, O. Cook, Whitewater	8
Second best, David Donnan, East Troy	4

The number of entries of fine wool sheep was very large, and most of the animals were of excellent quality.

H. HEMMENWAY,
R. T. GRAVES,
GEO. C. PRATT,
Committee.

The committee on the classes of long and middle wool, and fat sheep, after a careful consideration of the merits of the animals on exhibition in these departments, report the following awards:f

Class 20.—Long Wool Sheep.

Best buck, 2 years old and over, Robert Ogilvie, Madison.....	\$20
Second best, C. C. & R. H. Parks, Waukegan, Ill.....	10
Best buck, 1 year old and under 2, Robert Ogilvie, Madison.....	10
Second best, Robert Ogilvie, Madison.....	5
Best pen of 3 buck lambs, Robert Ogilvie, Madison.....	8
Second best, E. Porter, Waukesha	4
Best pen of 3 ewes, 2 years old and over, C. C. & R. H. Parks, Waukegan, Ill.	20
Second best, Robert Ogilvie, Madison.....	10
Best pen of 3 ewes, 1 year old and under 2, C. C. & R. H. Parks, Waukegan, Ill.	10
Second best, Robert Ogilvie, Madison.....	5
Best pen of 3 ewe lambs, Robert Ogilvie, Madison.....	8
Second best, C. C. & R. H. Parks, Waukegan, Ill.....	4

Class 21.—Middle Wool.

Best buck, 2 years old and over, Peter Wakem, Madison	\$20
Second best, Robert Ogilvie, Madison.....	10
Best buck, 1 year old and under 2, Robert Ogilvie, Madison.....	10
Second best, Peter Wakem, Madison	5
Best pen of 3 buck lambs, G. H. Lamberton, Lamberton.....	8
Second best, C. C. & R. H. Parks, Waukegan, Ill.....	4
Best pen of 3 ewes, 2 y'rs old and over, G. H. Daubner, Brookfield Centre	20
Second best, Robert Ogilvie, Madison.....	10
Best pen of 3 ewes, 1 year old and under 2, Robert Ogilvie, Madison ...	10
Second best, G. H. Daubner, Brookfield Centre.....	5
Best pen of 3 ewe lambs, C. T. Bradley, Milwaukee.....	8
Second best, C. C. & R. H. Parks, Waukegan, Ill.....	4

Class 22.—Fat Sheep.

Best fat sheep, not less than 3, Robert Ogilvie, Madison.....	\$10
Second best, E. Porter, Waukesha	5

In the classes of "long and middle wools" the competition was very close, and in many cases it was difficult to decide on the merits of different lots, but we have done the best we could on the information furnished us by the exhibitors. Several lots were exhibited by persons from other states, which were very creditable to the exhibitors, and added largely to the interest of the exhibition.

LEONARD COLEMAN,
DANIEL WILLIAMS,
HENRY STEVENS,
Committee.

In the discharge of the duties assigned them, the committee on swine and poultry were much embarrassed by the fact that, in a number of instances, animals of equal merit, yet of different breeds, came into competition for the same premiums. As your committee could not take upon themselves to decide between the different breeds, we have in a number of instances awarded like premiums to a number of entries in the same line, and would refer these matters to the executive board for final adjustment.

Class 23.—Swine.

SMALL BREEDS, (SUFFOLKS, CHINAS, ESSEXES, ETC).

Best boar, 2 years old and over, Wilder Chapin, Mukwanago	\$10
Best breeding sow, 2 years old and over, Richard Richards, Racine	10
Second best, Cool & Leffingwell, Palmyra.....	5
Best boar pig over 6 months old, Cool & Leffingwell, Palmyra.....	6

LARGE BREEDS, (BERKSHIRES, CHESTER WHITES, ETC).

Best boar, 2 years old and over, David Crinklaw, Marengo, Illinois	10
.....do.....do.....do..... Geo. H. Lamberton, Lamberton.....	10
Second best, August Ehaert, West Granville.....	5
Best boar, 1 year old and under 2, R. Richards, Racine	8
.....do.....do.....do..... A. Logan, Milwaukee	8
Best breeding sow, 2 years old and over, Cool & Leffingwell, Palmyra ..	10
Second best, G. H. Lamberton, Lamberton	5
Best breeding sow, with litter of pigs, David C. Crinklaw Marengo, Ill..	10
.....G. H. Lamberton, Lamberton....	10
Second best, David Crinklaw, Marengo, Ill.....	5
Best boar pig, over 6 months old, Richard Richards, Racine	6
.....D. Rowland, Racine	6
Second best, G. H. Lamberton, Lamberton	3
Best sow pig, over 6 months old, G. H. Lamberton, Lamberton (Poland)	6
.....D. Rowland, Racine (Chester White)..	6
.....R. Richards, Racine (Berkshire).....	6
Second best, Cool & Leffingwell, Palmyra.....	3

ANIMALS NOT ON LIST OF PRIZES OFFERED.

Boar pig, 3 months old (large), C. B. Durand, Racine .. Honorable Mention
 3 sow pigs, 3 months old (large), C. B. Durand, Racine, Honorable Mention
 Litter 12 pigs, over 6 months old, G. H. Lamberton, Lamberton, Honorable Mention.
 Litter 17 pigs, under six months old (large), J. W. Warren, Roscoe, Ill.
 Honorable Mention.
 Two barrow pigs, 6 months old (large), Charles Hart, Brookfield Centre,
 Honorable Mention.

Class 24.—Poultry.

Best trio Brahma Pootras, S. H. Seamans, Wauwatosa, Light Brahmas..	\$2
.....S. H. Seamans, Wauwatosa, Dark Brahmas ..	2
Best trio French fowls, Joseph Lee, Milwaukee, Houdans	2
Best trio Dorkings, S. H. Seamans, Wauwatosa	2
Best trio Cochín Chinas, S. H. Seamans, Wauwatosa	2
Best trio Spangled Hamburgs, H. B. Bateman, Ripon, silver penciled...	2
.....Wm. Reid, North Prairie, golden penciled	2
Best pair black Spanish, H. B. Bateman, Ripon.....	Honorable Mention
Best trio Polands, H. B. Bateman, Ripon.....	2
Best trio Bantams, H. B. Bateman, Ripon, golden	2

Best trio Bantams, H. B. Bateman, Ripon, game.	\$2
Scott Demick, Milwaukee, black Spanish	2
H. B. Bateman, Ripon, pair African, Honorable Mention	
Best trio turkeys, S. H. Seamans, Wauwatosa.....	2
Best pair Guinea fowls, C. H. Jacobs, Wauwatosa	2
Best pair geese, H. B. Bateman, Ripon	2
Best pair ducks, S. H. Seamans, Wauwatosa, Rouen.....	2
H. B. Bateman, Ripon, Cayuga.....	2
C. C. and R. H. Parks, Waukegan, Ill., Aylesbury.....	2
C. C. and R. H. Parks, Waukegan, Ill., white topknot .	2

FOWLS NOT ON PREMIUM LIST.

Trio white Leghorns, Joseph Lee, Milwaukee.....	Honorable Mention
Trio Leghorns, S. H. Seamans, Wauwatosa.....	Honorable Mention
Trio black Javas, H. B. Bateman, Ripon.....	Honorable Mention
Game fowls, H. B. Bateman, Ripon	Honorable Mention

The show of swine, though not extensive, was very fine—particularly the Berkshires and Chester Whites. We would respectfully suggest, from the evident increased interest felt in this branch of agricultural stock, that it would result vastly to the interests of the association as well as that of exhibitors, if the range of premiums was considerably extended; and that the different classes and breeds should be penned in adjoining pens, and not promiscuously, as at present.

The show of poultry was very extensive and extraordinary good, and we can safely say that no class attracted more attention. There was one continual crowd from morning to night every day around the coops. Choice breeds now sell readily from 100 to 300 per cent. more than they did ten or fifteen years ago, and there is no class of stock that will make so good returns for the amount invested as poultry. It is well known that some of the wealthiest and best educated men in the country are extensively engaged in this business. The result is that the choice poultry of to-day is far superior to that of years ago. We would also suggest the great necessity of a standard of qualities similar to those in the eastern states, as a guide for judges and exhibitors; also greater vigilance in the selection of judges in these classes, and to ascertain beforehand, if possible, if they will serve; if not to see that other competent persons will serve. Picking up judges at the last moment on the fair grounds, is not satisfactory either to judges or exhibitors. The judges in these classes this year were taken at the fair, at the last moment, and we had not one-half the time allowed us that was necessary to do justice. We would also suggest that a second premium be allowed for all varieties, and that the list be carefully revised to correspond to the times. For fifteen years "Leghorns" have been a leading variety, and yet no premium was offered this year.

JOHN DEARSLEY,

LYMAN OTIS,

H. C. WILLIAMS,

Committee.

AGRICULTURAL DEPARTMENT.

Your committee would respectfully report the following as their decision with reference to the awards of the premiums in Classes 25 and 26.

Class 25.—Field Products.

Best sample spring wheat, club, Robert Ogilvie, Madison	\$5
Best sample spring wheat, Rio Grande, M. J. Stearns, Galesville	5
Best sample spring wheat, fife, G. H. Lamberton, Lamberton	5
Second best, Robert Ogilvie, Madison	3
Best white winter wheat, M. J. Stearns, Galesville	5
Second best, Geo. Wolf, Staatsville	3
Best red winter wheat, M. Stearns & Son, Galesville	5
Best rye, E. M. De Puy, East Troy	5
Second best, G. H. Lamberton, Lamberton	3
Best oats, J. C. Starkweather, Oconomowoc	5
Second best, J. C. Starkweather, Oconomowoc	3
Best barley, Robert Ogilvie, Madison	5
Second best, T. D. Pilgrim, West Granville	3
Best buckwheat, G. H. Lamberton, Lamberton	5
Best flax seed, Geo. Wolf, Staatsville	5
Best hops, sack, G. J. Hanson, Kilbourn City	5
Second best, G. H. Lamberton, Lamberton	3
Best Timothy seed, John Aitken, Brookfield	5
Second best, Jas. C. Howard, Milwaukee	3
Best clover seed, G. H. Lamberton, Lamberton	5
Best beans, Luther Rawson, Oak Creek	5
Second best, Geo. Wolf, Staatsville	3
Best dent corn, J. J. Pellett, Oconomowoc	5
Second best, H. Gregg, Elm Grove	3
Best flint corn, Wm. Reid, North Prairie	5
Second best, Louis Fink, New Colm	3
Best bushel early potatoes, M. K. Young, Glen Haven	5
Second best, Joseph Desforages, Milwaukee	3
Best bushel late potatoes, white rose, M. K. Young, Glen Haven	5
Second best, A. M. Johnson, Greenfield	3
Best bushel carrots, C. B. Durand, Racine	3
Second best, Wm. Gordon, Kenosha	2
Best bushel turnips, H. Swallow, Hartland	3
Second best, J. C. Meacham, Genesee	2
Best bushel onions, Wm. Gordon, Kenosha	5
Second best, E. S. Purple, Waukesha	3
Third best, J. S. Wilcox, Milwaukee	2
Best dozen watermelons, J. C. Plumb, Milton	5
Second best, Wm. Gordon, Kenosha	3
Best exhibition of field products, including not less than five varieties of cereal grains, not less than 12 varieties in all, each sample being free to compete for the above individual prizes, J. C. Starkweather, Oconomowoc, Silver Medal and	20
Exhibition of tobacco, grown by exhibitor, Jacob Jank, Milwaukee, Hon- orable Mention.	
Exhibition turnips and onions, Stephen Sharp, Soldiers' Home, Honora- ble Mention.	
149 specimens of different variety of potatoes, M. K. Young, Glen Ha- ven, discretionary premium of	10
Samples winter squashes, Daniel Williams, Summit	3

Class 26.—Garden Vegetables.

Best 12 stalks of celery, J. G. Jones, Milwaukee.....	\$2
Second best, A. Zetterstrom, Kenosha.....	Transactions
Best 6 heads of Cauliflowers, J. Freitag, Milwaukee	2
Second best, J. S. Wilcox, Milwaukee.....	Transactions
Best 12 beets, J. C. Starkweather, Oconomowoc.....	2
Second best, J. S. Wilcox, Milwaukee.....	Transactions
Best 12 parsnips, Wm. Gordon, Kenosha.....	2
Second best, J. G. Jones, Milwaukee.....	Transactions
Best 3 heads cabbage, J. G. Jones, Milwaukee.....	2
Second best, J. Freitag, Milwaukee	Transactions
Best 12 tomatoes, Wm. Gordon, Kenosha	2
Second best, J. G. Jones, Milwaukee	Transactions
Best 12 purple egg plants, Wm. Gordon, Kenosha	2
Best 12 sweet potatoes, N. R. Allen, Kenosha	2
Second best, John N. Chamberlain, Beloit.....	Transactions
Best show garden products, Wm. Gordon, Kenosha.....	10
Second best, J. Freitag, Milwaukee.....	6

The display of field products and garden vegetables was much larger and more creditable in character, than that of previous years, but still it was far short of what a true presentation of the agricultural resources of our state would have made. An unusually large number of vegetables were exhibited and generally they were of an excellent quality. We were pleased to see the interest taken in these classes by a number of our leading farmers, who exhibited a large number of articles, which did much to increase the attractiveness of this department.

H. L. GILMAN,
P. SAWYER,
HIRAM BEEBE,
Committee.

Class 27.—Products of the Flouring Mill, Dairy and Apiary.

FLOUR.

Best 50 pounds spring wheat flour, G. H. Lamberton, Lamberton, Silver Medal or.....	\$10
Second best, Springler & Henrichsen, Milwaukee.....	5

BUTTER.

Best 25 pounds June made butter, N. D. Fratt, Racine, Silver Medal or	10
Second best, D. P. Webster, Mukwonago.....	5
Best 25 pounds made at any time, John Aitken, Brookfield, Silver Medal or	10
Second best, Mrs. D. McVean, Oconomowoc	5

CHEESE.

Best 3 cheeses, farm made, E. A. Carpenter, Pleasant Prairie	10
Second best, P. Putnam, Dodge's Corners.....	5
Best 3 cheeses, factory made, R. Wheeler, Milwaukee, Silver Medal or	10
Second best, C. Hazen, Fond du Lac.....	5

SAMPLES OF HONEY AND SUGAR.

Best 10 pounds maple sugar, David McVean, Oconomowoc	5
Best gallon maple syrup, Luther Rawson, Oak Creek	5
Best sample 10 pounds honey, T. Wilcox, Waupun.....	Silver Medal or 10
Second best, W. Wolf, Jefferson	5

H. STEVENS,
MRS. H. STEVENS,
AMOS SAWYER,
Committee.

Class 28.—Household Products.

BREAD AND CAKE.

Best two loaves Graham bread, Mrs. Geo. J. Kellogg, Janesville.....	\$3
Best two loaves white bread, Miss Susanna Cleveland, Milwaukee	3
Best two loaves Indian bread, Mrs. Geo. J. Kellogg, Janesville.....	3
Best sponge cake, Mrs. G. P. Pfeffer, Pewaukee	2
Best gold or silver cake, Miss Jennie Heth, Milwaukee.....	2
Best fruit cake, C. Farnam, Waukesha	2
Best and largest exhibition of articles of above sorts, Miss E. Tenney, Durham Hill	Diploma and 10

SEALED AND PRESERVED FRUITS.

Best exhibition of preserved fruits, in variety not less than six sorts, J. W. Parks, Dodge's Corners.....	Second premium 2
Best collection of sealed fruits, not less than five sorts, W. G. Benedict, Milwaukee.....	5

PICKLES.

Best and greatest variety pickles, not less than eight, second premium, J. W. Park, Dodge's Corners.....	2
Best sample vinegar, F. W. Boden, Milwaukee	Diploma

MRS. M. B. COLEMAN,
MRS. OLIVER AREY,
MRS. N. D. FRATT,

Committee.

Class 29.—Fruits by Professional Cultivators.

APPLES.

Best and greatest variety, not less than three specimens each, A. G. Tut- tle, Baraboo.....	Gray's Botanical Text Books, \$15
Second best, G. P. Pfeffer, Pewaukee.....	Chromo, Sunset, 10
Third best, H. W. Thompson, St. Francis, Chromos, Under the Apple Tree; Rest by the Roadside.....	5
Best 10 varieties, adapted to the northwest, A. G. Tuttle, Baraboo, Chro- mo, Easter Morning.....	10
Second best, H. M. Thompson, St. Francis, Chromo, The Barefooted Boy,	5
Best five varieties, adapted to northwest, C. H. Greenman, Milton, Chro- mo, Wild Fruit.....	5
Second best, J. Gould, Beaver Dam.....	The Horticulturist one year 3
Best show of autumn apples, A. G. Tuttle, Baraboo, Chromo, Before the Frost	3
Second best, G. P. Pfeffer, Pewaukee.....	Western Farmer one year 2
Best show of winter apples, A. G. Tuttle, Baraboo, Solid Silver Spoons	10
Second best, G. P. Pfeffer, Pewaukee	Chromo, Evening 5

PEARS.

Best and greatest variety Pears, 3 specimens each, G. P. Pepper, Pewaukee; Silver Headed Cane.....	\$10.
Second best, George Wolf, Staatsville, Chromo, Morning.....	5

PLUMS.

Best and greatest variety, 3 specimens each, George Wolf, Staatsville, Gold Pen and Holder	5
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GRAPES.

Best and greatest variety, not less than 3 bunches each, A. G. Tuttle, Baraboo, Chromo, The Birthplace of Whittier, the Poet.....	15
Second best, C. H. Greenman, Milton, Insects Injurious to Vegetation ..	8
Third best, Geo. J. Kellogg, Janesville, Western Farmer for 1871, Chromo, Our Kitchen Boquet	5
Best three varieties adapted to general culture, Geo. J. Kellogg, Janesville, Downing's new Fruit Book.....	7 50
Best 2 varieties, C. H. Greenman, Milton, Strong's Grape Culturist....	3
Best 1 variety, Geo. J. Kellogg, Janesville, Western Rural.....	2
For largest Bunch of Native Grapes, A. G. Tuttle, The Western Pomologist	1
For largest bunch Delaware Grapes, Geo. J. Kellogg, Janesville, Western Pomologist.....	1

Your committee would recommend in the future arrangement of fruit at fairs that one portion of the building be set aside for professional displays; another portion for non-professional. Such a grouping would much facilitate the examination by the judges, lessen their labor, and add much to the effectiveness of the display.

L. L. FAIRCHILD,
E. W. DANIELS,
MARK DRESSER,
S. G. SWAIN,
JOHN BENDER,

Committee.

CLASS 30—*Fruits by Non-professional Cultivators.*

APPLES.

Best and greatest variety, not less than 3 specimens, H. Floyd, Berlin, Chromo, Launching the Life Boat.....	15
Second best, Wm. Findlayson, Mazomanie, Gold Pen and Holder	10
Third best, J. W. Parks, Dodge's Corners, Chromo, Morning....	5
Best 10 varieties, not less than 3 specimens each, Wm. Findlayson, Mazomanie, Solid Silver Spoons.....	10
Second best, John H. Paul, Genessee, Chromo, Not Caught Yet, and the Horticulturist for 1871	5
Best 5 varieties adapted to the northwest, James Ozannie, Jr., Racine, Figuier's Insect World.....	6
Second best, John H. Paul, Genessee, Journal of Horticulture for 1871.	3
Best show Autumn Apples, H. Floyd, Berlin, Chromo, After the Rains.	3
Second best, Wm. Findlayson, Mazomanie, Horticulturist.....	2
Best show of Winter Apples, Wm. Findlayson, Mazomanie, Chromo, Summer Fruit and Autumn Fruit, two pieces	10
Second best, James Ozannie, Racine, Solid Silver Spoons	5
For largest specimen Apple, Ira Fuller, Baraboo (size 15 inches in circumference), Chromo, Victory	1
Show Crab Apples, Geo. Wolf, Staatsville.....	Honorable Mention..
Display Figs, G. P. Pepper, Pewaukee.....	Honorable Mention.

PEARS.

Best and greatest variety Pears, 3 specimens each, E. B. Thomas, Dodge's Corners, Silver Fruit Dish.....	10
Second best, James Ozannie, Jr., Racine, Downing's Cottage Residences,	5

PLUMS.

Best and greatest variety, 3 specimens each, N. Brick, Milwaukee, Gold Pen and Holder	5
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GRAPES.

Best and greatest variety, 3 bunches each, Wm. Reid, North Prairie, Gold Headed Cane.....	15
Best show Foreign Grapes, grown under glass; Mrs. Alexander Mitchell, Milwaukee, Chromo.....	5
Best 2 varieties Grapes, E. B. Thomas, Dodge's Corners, Mead's Grape Culture.....	3
Best 1 variety adapted to general culture, Mrs. Caroline Curtis, Milwaukee, Western Farmer	2

PEACHES.

Best show Peaches, H. Floyd, Berlin, Horticulturist	3
Best show Fruits grown under glass, Mrs. Alexander Mitchell, Milwaukee, Diploma and.....	10

GEO. J. KELLOGG,

J. C. PLUMB,

C. H. GREENMAN,

GEO. P. PEFFER,

CHARLES WATERS,

*Committee.**Class 31.—Seedlings.*

Best seedling apple, N. W. Cromwell, Wauwatosa, Western Farmer and the Horticulturist.....	5
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A number of very fair and good varieties of seedlings were on exhibition. A few specimens were presented as seedlings, which the committee regarded as doubtful. The above apple, receiving the first premium, is large, sour, yellow ground, striped with red. The committee would mention *favorably* Worden's Seedling Grape, shown by Geo. J. Kellogg, of Janesville.

A. G. TUTTLE,

J. S. STICKNEY,

*Committee.**Class 32.—Flowers by Professional Cultivators.*

Best floral design of natural leaves and flowers, Whitnall & Ellis, Milwaukee, Gents' Cane.....	10
Second best, Dunlop & Middlemass, Milwaukee, Set Silver Knives....	5
Best and most tastefully arranged and largest collection of cut flowers, Whitnall & Ellis, Milwaukee, Set Silver Forks.....	5
Second best, Miss Kate Pepper, Pewaukee, Horticulturist.....	3
Best and most tastefully arranged basket of flowers, H. Hæssler, Milwaukee, Silver Fruit Knife.....	2
Second best, Dunlop & Middlemass, Milwaukee, Western Pomologist..	1
Best pyramidal boquet, Dunlop & Middlemass, Milwaukee, Journal of Horticulture	3
Best pair round boquets, Dunlop & Middlemass, Milwaukee, Boquet holder.....	3

Best pair flat boquets, H. Hæssler, Milwaukee, Silver Cup.....	\$2
Best bouquet everlasting flowers, J. Frietag, Milwaukee, Chromo worth..	3
Best display of dahlias, not less than 20 varieties, Miss Kate Pepper, Pewaukee, Chromo worth	5
Best ten named dahlias, Wm. Gordon, Kenosha, Boquet Holder.....	3
Best five named varieties, Mrs. J. C. Plumb, Milton, Silver Tea Bell.....	2
Best display of roses, Dunlop & Middlemass, Milwaukee, Solid Silver Spoons	5
Second best, Miss Kate Pepper, Pewaukee, Horticulturist.....	3
Best 5 named varieties of roses, H. Hæssler, Milwaukee, Horticulturist	3
Best and greatest variety named vebenas, Whitnall & Ellis, Milwaukee, Butter Knife	3
Best show Dianthus, (pink) Miss Kate Pepper, Pewaukee, Vase.....	2
Best show gladiolus, Miss Kate Pepper, Pewaukee, Vase.....	2
Best show tuber roses, H. Hæssler, Milwaukee, Chromo.....	1
Seedling verbenas, Miss Kate Pepper, Pewaukee, Silver Tea Bell.....	2
Best show of ornamental foliage plants, Mrs. Alex. Mitchell, Milwau- kee, Ornamental Vases.....	5
Best show green-house plants, Casper Thoman, Milwaukee, Diploma and	10
Second best Dunlop & Middlemass, Milwaukee.....	5
The committee are of the opinion that Joseph Pollard's (Gardener to Mrs. Mitchell,) show far exceeded all others, but she withdrew from com- petition with gardeners, and we award a special premium, Silver Knives and Forks.....	10
Best 20 varieties of green-house plants in bloom, Dunlop & Middlemass, Milwaukee, Set Silver Knives	10
Best 10 geraniums in bloom, J. Frietag, Milwaukee, Silver Card Receiver	5
Best 6 fuchias in bloom, J. Frietag, Milwaukee, Rand's Flowers for Par- lor and Garden.....	3
Best 6 carnations, H. Hæssler, Milwaukee, Silver Fruit Knife	3
H. Happinröth, for display house plants and tea roses, very fine, discre- tionary, Silver Spoons	5

GEO. V. OTT,
H. W. ROBY,
PETER POLLARD,
DR. KOSS,
I. A. LAPHAM,
J. G. KNAPP,
Committee.

Class 33.—Flowers by Non-professional Cultivators.

Best and most tastefully arranged Cut Flowers, J. W. Parks, Dodge's Corners	Silver Forks, worth \$5
Second best, A. M. Johnson, Greenfield	Horticulturist 3
Best display Dahlias, Mrs. A. A. Boyce, Lodi.....	Chromo 5
Best 10 named Dahlias, Mrs. A. A. Boyce, Lodi.....	Boquet Holder 3
Best 5 named Dahlias, Mrs. A. A. Boyce, Lodi.....	Silver Tea Bell 2
Best show Seedlings, A. M. Johnson, Greenfield	Tea Bell 2
Best show Phlox, Wm. Reid, North Prairie	China Vase 1
Best show Petunias, J.W. Parks, Dodge's Corners, River's Miniture Fruit Garden, worth	1
Best show Dianthus, A. M. Johnson, Greenfield	Vase 2
Best show Ornamental Foliage Plants, H. W. Roby, Milwaukee, Orna- mental Vases, worth	5
Display Balsams, Mrs. P. Yale, Milwaukee	Rural Studies 3
Calla in Bloom, A. M. Johnson, Greenfield.....	Book 2

H. W. ROBY,
Miss KATE PEFFER,
Mrs. J. C. PLUMB,
Committee.

Class 34.—Wine.

Best sample of Grape Wine, G. H. Lamberton, Lamberton, Moore's Rural
 New Yorker, worth..... \$3
 Black Currant Wine, J. Gould, Beaver Dam Honorable Mention

With one exception the exhibitors in this class failed to comply with the printed regulations in presenting a written statement giving information respecting manufacture. We would recommend that the premiums offered in this class, in future, be restricted to wine for medical purposes. We think the black current wine exhibited by J. Gould, of Beaver Dam, is worthy of honorable mention.

GEO. J. KELLOGG,
 C. H. GREENMAN,
 CHA'S WATERS,
Committee.

Class 35.—Society Exhibition.

Best exhibition of Fruit and Flower Department, by any Local Society,
 Milton Farmers Club, Milton.....\$50

J. S. STICKNEY,
 RUDD & KOSS,
 A. G. TUTTLE,
Committee.

Class 36.—Machinery for Agricultural Purposes.

In this class no premiums were offered, and no judges were appointed. The following were the entries made:

REAPERS AND MOWERS, SINGLE AND COMBINED.

Dodge's, C. C. Bradley & Son, Milwaukee.
 New York, Little Champion and Meadow King, S. L. Sheldon, Madison.
 Beloit, L. P. & M. P. Jerdee, Madison.
 Climax, E. W. Skinner & Co., Madison.
 Ball, E. Ball, Chicago.
 William's and Clipper, E. Wright, Milwaukee.
 Wood's, M. E. Fuller & Co., Madison.
 J. P. Manny's, W. C. Thompson, Rockford, Ill.
 Kirby and Burdick, D. M. Osborn & Co., Chicago, Ill.
 Ætna, R. C. Farthing, Ripon.
 Esterly, Geo. Esterly, Whitewater.
 Johnson's Self-Rake, C. C. Bradley & Son, Milwaukee.
 Excelsior, John Smith, Fess Corners.
 Clow, H. W. Smith, Janesville.
 Marsh Harvester, J. O. Eaton, Chicago, Ill.
 Yankee, A. Fowler, Milwaukee; E. J. Lindsay, Milwaukee; Harris & Co., Janesville; Preston & Cheney, Manlius, N. Y.

SEEDERS AND CULTIVATORS.

L. P. & M. P. Jerdee, Madison; Lamson & Roach, Madison; Hill & Vaughn, Madison; Carter Smith, Janesville; J. S. Rowell & Co., Beaver Dam; Geo. Esterly, Whitewater; Van Brunt & Co., Horicon; W. F. Whitney, Milwaukee; S. L. Sheldon, Madison; L. S. Bush & Co, Milwaukee; N. E. Allen, Fox Lake; Agricultural Manufacturing Co., Lake Mills; R. C. Farthing, Ripon.

HORSE RAKES.

W. F. Whitney, Milwaukee; L. S. Bush & Co., Milwaukee; G. S. Farnsworth, Chicago, Ill.; L. P. & M. P. Jerdee, Madison; G. F. Walker, Des Moines, Iowa; E. J. Lindsay, Milwaukee; Fuller & Co., Madison.

CORN SHELLERS.

L. S. Bush & Co., Milwaukee; A. Fowler, Milwaukee.

FEED CUTTERS.

Hand and Horse, A. Fowler, Milwaukee; E. J. Lindsay, Milwaukee; Philip V. Coon, Milwaukee.

Cumming's and Continental, L. S. Bush & Co., Milwaukee.

Meat and Vegetable Cutters, 5 sizes, E. White, Milwaukee.

Bog Cutter, O. F. Weed, Palmyra.

THRESHING MACHINES.

Horse Power, C. E. Owens, Milwaukee.

Steam and Woodbury Power, Geiser & Co., Racine.

Steam and Horse, J. I. Case, Racine.

Threshing Machine Fan, and Grain Register, Geiser & Co., Racine.

Grain Register, F. R. Melvin, Brooklyn.

Horse Powers, (Four wheeled Mounted and Badger State), Geiser & Co., Racine.

Hand and Feed Power, G. H. Stewart, Beaver Dam.

Challenge Feed Mills, Challenge Mill Co., Batavia, Ill.

Grist and Feed Mill, O. L. Packard, Milwaukee.

Forsman's Iron Clad Grist Mill, 4 sizes, S. F. Compton, Milwaukee.

Fanning Mill, R. D. Baker, Milwaukee; Ayres & Fleckner, Dalton; A. H. Cutting, Racine.

Sickle Grinder, E. J. Lindsay, Milwaukee.

Corn Planter (Horse), Elyria Agricultural Works, Elyria, O.

Wind Mill, W. H. Wheeler, Beloit.

Side Dropper for Reaper, E. P. Cady, Beaver Dam.

Lawn Mowers, Philadelphia and Landscape, L. S. Bush & Co., Milwaukee.

Cider Mills, E. J. Lindsay, Milwaukee; L. S. Bush & Co., Milwaukee; H. B. Goucher, Janesville.

Wood Sawing Machine, H. Woodward, Milwaukee.

Derrick. John Sheldon, Milwaukee.

CLASS 37—*Implements, etc. for Agricultural Purposes.*

No premiums were offered and no judges were appointed. The following articles were exhibited:

Step Ladders, Lansing Bonnell, Milwaukee; Millard Bros. Milwaukee.

Plows—Shovel, M. B. Goff, Delavan; Gang, H. L. Perry, East Hamburg, N. Y.; Automatic, Porter & Frary, La Moille, Illinois; Steel in variety, Dodge, Kimball & Austin, Kalamazoo, Michigan; Stubble, S. J. Herman & Co., Savannah, Illinois; in variety, O. M. Holford, Milwaukee; Sod and Stubble and Iron Beam in variety, W. F. Whitney, Milwaukee; Steel, Dorsch & Mathers, Milwaukee; Dixon, L. S. Bush & Co., Milwaukee.

Cultivators, E. W. Skinner, & Co., Madison; Dorsch & Mathers, Milwaukee.

Horse Forks, L. S. Bush & Co., Milwaukee.

Hay Forks, F. Packard, Neenah; Van Brunt & Co., Horicon; Harpoon, L. S. Bush & Co., Milwaukee; with Tackle, John Miles, Milwaukee; E. J. Cable, Lake Mills.

Extension Ladder, G. P. S. Sherman, Milwaukee.

Pumps, Force, C. J. Bliss, Milton Junction; B. W. Felthousen, Milwaukee; A. D. Gates, Oshkosh; C. A. Bradley, Milwaukee; W. H. Wheeler, Beloit; Chain, R. W. Church, Milwaukee; Farm, P. Gormley & Co., Delavan; in variety, M. M. Leahy, Milwaukee; W. H. Hiner & Co., Fond du Lac.

Well Pulleys, L. S. Bush & Co., Milwaukee.
 Portable and Farm Fence, S. Park Coon, Milwaukee; L. Field, Grove.
 Farm Gates, S. Sackett, Waukesha; M. Gaushenan, Briton, Michigan; L. L. Hatch, Boltonville; D. McAvoy, Milwaukee.
 Churns, G. P. Sherman, Milwaukee; Red Jacket, Bucholz & Wergin, Milwaukee; A. H. Conkey, Appleton.
 Milk Can, Iron Clad, Milk Can Co., 42 and 44, Murray street, New York.
 Butter Transporter, J. W. Thayer, Palmyra.
 Steaming Apparatus, J. O. Fairbairn, Milwaukee; (Andersons), Carter Smith, Janesville; A. Stangeland, Milwaukee.
 Egg Carrier, F. Campbell, Chicago, Illinois.
 Bag Holder, M. Boynton, Palmyra; Judd & Hiles, Milwaukee.
 Harrows, H. H. Pratt, Hart, Michigan; G. H. Stewart, Beaver Dam.
 Washing Machine, A. C. Stanard, Milton; Wm. Gowan, Wausau; Doty, Lansing Bonnell, Milwaukee.
 Apple Parer, Corer and Slicer, G. P. Sherman, Milwaukee.
 Buck Saw, John Pritzloff, Milwaukee.
 Corn Husker, Joel Hood, Milwaukee.
 Garden Wheelbarrow, L. S. Bush, Milwaukee.
 Husking Gloves, F. Campbell, Chicago.
 Clothes Line Reel, E. Brodhead, La Crosse.
 Clothes Line Elevator, G. F. Walker, Des Moines, Iowa.
 Bag Holder and Scales, F. Field, Grove.
 U. S. Bag Holder and Scales combined, Whalen & Wakeley, Madison.
 Ox Bow Key, G. P. Sherman, Milwaukee.
 Brush Holder and Mop Stick, D. Carr, Milwaukee.
 Post Hole Digger, Smith, Ellis & Stearns, Beaver Dam.
 Steam Generator, Inmann & Withington, Janesville.
 Water Elevator, W. G. Hamilton, Milton.
 Grind Stone Holder, P. V. Dunn, Fall River.
 Gate and Door Fastener, R. Atkins & Co., Fond du Lac.
 Sieves and Riddles, Maschemer & Frankfurth, Milwaukee.
 Agricultural Implements in variety, Pierce & Whaling, S. Bush & Co., Milwaukee.

Class 38.—Machinery for Manufacturing Purposes.

No premiums were offered in this class and no judges were appointed. The following articles were exhibited.

Sewing Machines—Florence, Florence Company, Milwaukee; Ætna, C. F. Kleimstruber, Milwaukee; Grover & Baker, Grover & Baker, Milwaukee; Howe's, G. T. Bryant, Milwaukee; Wheeler & Wilson, G. E. Treat, Milwaukee; Singer, Kasson & Noyes, Milwaukee; Domestic, Wolcott & Gregg, Milwaukee.
 Upsetting Machine, A. C. Calkins, Hamburg, N. Y.
 Hub Machine, Wm. Gartno, Milwaukee.
 Steam Guages, Valves, Cocks, etc., M. M. Leahy, Milwaukee.
 Hub Turning Machine, Goodyears, Hugo Luebben, Sheboygan.
 Sausage Machine, Steam and Hand, Wm. Miller, Milwaukee.
 Governor for Windmill, Tobias Braum, Randolph Center.
 Portable Farm Engine, Geiser Threshing Machine Company, Racine.
 Steam and Water Guage, Butterfield & Worden, Madison.
 Knitting Machine, Crane, Crane Knitting Machine Company, Lake Mills.
 Knitting Machine, Lamb's, Hurlbert Bros. & Co, Chicago.
 Knitting Machine, S. Sackett, Waukesha.
 Pressure Blower, Pierce & Whaling, Milwaukee.
 Turbine Water Wheel, 3 samples, O. E. Merrill & Co., Milwaukee; Stillwell, Pierce & Co., Dayton; Ohio.
 Movable Brass Journal Boxes, E. W. Skinner & Co., Madison.

Log Rolling Machine, A. Rodgers, Muskegan, Michigan.
 Saw Mill, Horse Power, Smith & Bennett, Watertown.
 Bolt and Rivet Cutter, M. D. Taylor, Mt. Hope.
 Swedging Machine, S. M. Hinkley, Milwaukee.
 Portable Engine, Rotary Bed Planing Machine, Pony Planing Machine,
 Mortising Machine, Drilling Machine, Matching Machine, Wood Lathe,
 Governors, Upright Shaper, Heater and Lime Catcher, O. L. Packard,
 Milwaukee.
 Stave Machine, (model,) Bishop Bros, Milwaukee.
 Model Water Wheel, J. S. Anderson, Oconomowoc.
 Pony and Panel Planers, Frank & Co., Buffalo, N. Y.
 Swedging Machine, Eaton & Co., Milwaukee.
 Safety Knuckle and Joint, A. J. Langworthy, Milwaukee.
 Display Saws, Hoe & Co., New York.
 Automatic Grinder for Edged Tools, W. H. Smith, Brooklyn, N. Y.
 Steam Governor, Lauterman Steam Governor Company, Chicago, Ill.
 Augur Bitts, A. C. Kasson & Co., Milwaukee.
 Automatic Boiler Feeder, Chas. A. Smith, Milwaukee.
 Shafting, Coupling and Steam Fitting and Furnishing Goods, Pierce & Whal-
 ing, Milwaukee.
 Portable Forge, Pierce & Whaling, Milwaukee.
 Sets Carving and Carpenter Tools, Maschemer & Frankfurth, Milwaukee.
 Chair Seating Machine, Henry Meyer, Grafton.
 Steam Engine, Eaton & Co., Milwaukee.
 Set Works for Saw Mills, Wm. Gowen, Wausau.

The committee on Carriages and Leather and Leather Manufactures, af-
 ter a careful examination of the articles on exhibition, report the following
 awards:

Class 39.—Carriages, Harnesses, Etc.,

Best double carriage, Rice & Mock, Milwaukee, Silver Medal or	\$10
Weschelberg Bros., Milwaukee.	Honorable Mention
Best single top buggy, Geo. W. Ogden & Co., Milwaukee.....	10
Rice & Mock, Milwaukee	Honorable Mention
Best single open buggy, Geo. W. Ogden & Co., Milwaukee	10
Rice & Mock, Milwaukee.....	Honorable Mention
Best double sleigh, Rice & Mock, Milwaukee.....	10
Best single sleigh, Rice & Mock, Milwaukee	5
Best lumber wagon, John Esch & Co., Milwaukee.....	10
J. & J. Eglehoff, Milwaukee	Honorable Mention
Patent dump wagon, John Esch & Bro., Milwaukee.....	Diploma
Business wagon, Deming & Galcher, Milwaukee	Diploma
Jump seat carriage, Rice & Mock, Milwaukee.....	Honorable Mention
Patent wagon box, J. A. Bowers, Ellwood, Ill.....	Diploma
Child's carriage, Frank Rezach, Milwaukee	Honorable Mention
Trotting Sulky, Iverson, Harden & Erickson, Waterford	Honorable Mention
Axles, Pierce & Whaling, Milwaukee.....	Honorable Mention
Sleigh brake, E. J. Cooper, Mineral Point.....	Diploma

HARNESSES, ETC.

Best single harness, M. Hilgenthal, Milwaukee	Silver Medal
Wooden collar and harness combined, Gunnip, Short & Co., Danville, Ill	Honorable Mention
Carriage mats, J. Balwick, Milwaukee.....	Diploma
Dyed Sheepskins, G. Prockman & Co., Milwaukee....	Honorable Mention

Class 40.—Leather and Leather Manufactures.

Best and largest exhibition of gents' boots and shoes manufactured in Wisconsin, Atkins, Steele & White, Milwaukee, Silver Medal and...\$10
 Second best, R. L. Gove, Waukesha..... Bronze Medal and Transactions
 Best and largest exhibition of ladies' boots and shoes manufactured in Wisconsin, R. L. Gove, Waukesha, Silver Medal and..... 10
 Second best, Atkins, Steele & White, Milwaukee, Bronze Medal and Transactions
 Display of trunks, valises and satchels, Geo. Burroughs, Milwaukee. Diploma
 Leather and rubber belting and packing, M. M. Leahy, Milwaukee. Diploma
 Display manufactured raw hide goods, Darrow's Manufacturing Company, Bristol, Ct..... Diploma

The number of buggies, single and double carriages exhibited was very large and all were fair specimens, of good workmanship and excellent finish, showing conclusively that Wisconsin need no longer depend on the east for goods of this class. In the farm wagons there was the usual variety, but your committee were much disappointed in finding the entries confined to Milwaukee work. The high reputation enjoyed by other portions of the state for this class of goods, should have secured a good representation from them. A patent dumping wagon by John Esch & Co., we think possesses novelty and merit. A heavy draft wagon entered by Jas. Wood & Co., we think one of the finest pieces of workmanship ever exhibited at our state fair. Under the head of harnesses and saddles, the entries were very meagre, and but one of them of sufficient merit to warrant an award. Under the head of boots and shoes, the entries were confined to two firms—Atkins, Steele & White of Milwaukee and R. L. Gove & Bro., of Waukesha, both possessing much merit, and sustaining the well earned reputation of Wisconsin workmen.

Although the show in these classes was a great improvement on former years, still we think that the manufacturing interest of Wisconsin owes it to itself to make still larger strides in the same direction.

H. W. CASS,

D. H. BUDD,

Committee.

The committee appointed for Classes 41 and 42 report the following articles as in their opinion justly entitled to the prizes offered:

Class 41.—Cabinet Ware, Wagon-Work, Cooperage, Willow Ware.

Best and largest display of cabinet ware, Wisconsin made, in variety, Matthew Bros., Milwaukee..... Silver Medal
 Best butter firkins, oak, J. J. Seefeldt, Sheboygan Falls Diploma
 Best display of cooperage and wooden ware, C. S. Redfield, Madison, Honorable Mention.
 Best splint basket of oak or ash, Judd & Hiles, Milwaukee Diploma
 Best display of willow ware made in state, A. Meinecke, Milwaukee, Silver Medal.
 Best window blinds, Judd & Hiles, Milwaukee..... Diploma
 Best window sash, Judd & Hiles, Milwaukee Diploma
 Best doors, Judd & Hiles, Milwaukee Diploma

Best show of doors, sash, blinds, Judd & Hiles, Milwaukee.. Silver Medal
 Weather strip, Torrey's patent, E. Fielding, Milwaukee..... Diploma
 Office desks, circular fall, J. F. Burchard, Milwaukee..... Diploma
 Spring bed, wire woven, J. F. Burchard, Milwaukee..... Diploma
 Window screen and musquito bar, A. F. Temple, Milwaukee ... Hon.Men.
 Earth closets, J. C. Davidson, Chicago, Ill..... Diploma
 Spring white wire bed bottom and mattresses, Geo. Richardson, Milwaukee Honorable Mention
 Dozen brooms, John Graham, Milwaukee..... Diploma
 School desks, A. H. Andrews, Chicago, Ill..... Diploma
 Thimble-skeins, C. F. Ravn & Co. Milwaukee Diploma
 Show case, Wm. Streuder, Milwaukee Diploma
 Refrigerator, Cormillie, Bros., Milwaukee..... Diploma
 Galvanized iron cornice, C. A. Buttles, Milwaukee Diploma
 Display wash boards, G. R. Wright, Milwaukee..... Diploma
 Spring bed bottom, Jenkins, Fitzgerald & Co., Milwaukee Hon. Men
 Refrigerator, Vogt's patent, Lansing Bonnell, Milwaukee Diploma
 Sofa, bed, settee and table combined, C. F. Kramer, Augusta Wis Diploma
 Ladies' table, Charles Witte, Kekoskee, Wis Silver Medal
 Dry earth closets, Northwestern Earth Closet Co., Milwaukee, Special
 Commendation.
 Paper hangings and decorations, T. B. Collingbourne, Milwaukee, Diploma

Class 42.---Bee Hives and Bee Management,

Best hive adapted to practical bee culture, S. Sackett, Waukesha,
 "Longstroth" Diploma
 Bee hive, N. Stearns & Son: Galesville..... Honorable Mention

A. N. PHELPS,

E. D. FILER,

Committee.

Class 43.—Minerals and Various Metallurgic Products.

Best show of iron ores with pig iron and specimen of castings therefrom,
 Milwaukee Iron Company Silver Medal
 Best show of zinc ores, with manufactures therefrom, Britannia and
 Plated Ware Company, Milwaukee Silver Medal
 Babbit's metal, Britannia and Plated Ware Company, Milwaukee, Diploma
 Samples of coal, Fetty & Hartel, Milwaukee..... Honorable Mention
 Samples iron, nails, sheet and American-Russia iron, Pierce & Whaling,
 Milwaukee Honorable Mention
 Rock and ground plaster, Davis Bro. & Co., Milwaukee, Honorable Mention

In iron ores there was no competition with the exhibition of the Milwaukee Iron Company, which was very creditable and well worthy the premium. They exhibited specimens of ores from Iron Ridge and Lake Superior; also of pig iron made from the several ores; a "puddle-ball" and a rail forty feet in length, manufactured at their rolling mills. The samples of iron, nails, American Russia iron and galvanized sheet iron, exhibited by Pierce & Whaling, deserve very high commendation, separately and collectively. We have never seen anything in this line superior to these specimens.

The committee desire to call special attention to the samples of Rock and Ground Plaster, exhibited by Davis Bro. & Co., of Milwaukee. The rock plaster is brought from Michigan, and ground at their mills. It is the opinion of the committee that ground plaster is of very great value as a

fertilizer, and that encouragement should be given to those who put it into the market at reasonable prices.

It was a matter of surprise to the committee that Wisconsin, so rich in mineral resources, was not more fully represented.

J. C. PICKARD,
P. H. TURNER,
W. H. WATSON,

Committee.

Class 44.—Stoves, Furnaces, Hollow-ware and other Metallic and Chemical Manufactures.

Best cooking stove, C. A. Buttles, Milwaukee	Diploma
Best ornamental parlor stove, Peterman, Stredy & Co., Milwaukee, oriental improved base burner	Diploma
Best show of hollow ware, G. A. Abert, Milwaukee	Diploma
Best sample fire grates, Lansing Bonnell, Milwaukee	Diploma
Best and most economical lighting apparatus for hotel and family use, W. H. Smith, Brooklyn, New York	Diploma
Best horse shoes in variety, J. R. Taylor, Barton	Diploma
Best caddy of Lucifer matches, made in Wisconsin, Barber & Co., Milwaukee	Diploma
Best samples bar soap, Johnson & Thyng, Milwaukee	Diploma
Best show of perfumery, A. E. & H. W. Foote, Milwaukee	Diploma
Best display of soaps, perfumery, etc., for the toilet, by manufacturer, Deleme & Quentin, Milwaukee	Silver Medal
Display of scales, Lansing Bonnell, Milwaukee	Diploma
Flour seive, C. Beucus, Waupun	Diploma
Cottage bird cage, Geo. A. Merle, Milwaukee	Honorable Mention
American broiler, C. Shepard & Co., Milwaukee	Honorable Mention
Mangle, Maschamer & Frankfurth, Milwaukee	Honorable Mention
Fluting and polishing irons, A. E. Monroe, Milwaukee	Honorable Mention
Heating apparatus, Cushing Albee, Chicago	Diploma
Folding iron chair, W. H. Brazier & Co., Milwaukee	Diploma
Stove polish, Milwaukee Stove Polish Company	Honorable Mention
Ornamental fountains, S. F. Harker, Milwaukee	Diploma
Flavoring extracts, B. F. Cook, Milwaukee	Honorable Mention
Wire screen and sieves, Daniel Daggett, Milwaukee	Diploma
Brass and iron steam goods, Hoffman, Billings & Co., Milwaukee	Diploma
Case of pipes and other smokers' goods, G. Weinberg, Milwaukee	Diploma
Display guns, J. C. Welles, Milwaukee	Diploma
Target gun, John Menners, Milwaukee	Diploma
Portable furnace, C. A. Buttles, Milwaukee	Diploma
Wood preserver, Geo. P. Sherman, Milwaukee	Honorable Mention
Stove pipe cylinder, C. A. Buttles, Milwaukee	Honorable Mention
Liquid glass cement, R. W. Patten, Brodhead	Diploma
Horse nails, John Pritzoff, Milwaukee	Diploma
Patent drum, stove pipe joints and elbow, Jacob Heyer, Jefferson	Diploma
Stove pipe joint, Geo. P. Sherman, Milwaukee	Honorable Mention
Fire proof safe, Fowler & Pennell, Milwaukee	Diploma
Blacksmith's furnishing goods, James Wood & Co., Milwaukee	Diploma
Nail extractor, Geo. P. Sherman, Milwaukee	Diploma
Carbon oil tank, Millard Bros., Milwaukee	Honorable Mention
Samples blacking, blueing, chocolate and Boston yeast cakes, W. G. Benedict, Milwaukee	Diploma
Lubricating oil, S. A. Bentley, Chicago	Honorable Mention

N. P. ROCKWOOD,
C. A. CARRIER,

Committee.

FIRE EXTINGUISHERS.

S. F. Crampton, Milwaukee, Babcock's Silver Medal.
 J. C. Davison, Chicago, Excelsior..... Bronze Medal.

The foregoing awards were made by the executive board on the basis of the following report of the special committee:

The special committee to whom was referred the question of determining between the claims of the two fire extinguishers, the Babcock and Excelsior, beg leave to submit the following report:

In order to give the committee an opportunity to judge of the merits of these machines in extinguishing fires, the proprietors of each erected on the fair grounds, a small wooden structure, in the interior of each of which was placed a number of tar barrels, together with a lot of pine shavings. These structures and their contents were saturated with kerosene oil. The buildings were then set on fire, inside and out, and when tolerably well under way, the word was given, and the machines set to work.. Both fires were extinguished in about the same length of time, but the committee were of the opinion that the Babcock was clearly entitled to the preference in this trial, because the lumber of which its structure was composed was much the dryest, and the fire had therefore made greater progress before the word was given to extinguish. This was quite apparent from the difference in the burnt and charred state of the two structures after the fire was extinguished.

In coming to the proper conclusion as to the respective merits of these two rival fire extinguishers, the committee were unable discover any very radical difference between them, as both are very similar in their construction, and in the manner of their operation, the only difference being in the manner in which they are respectively charged with acid, and in this respect, the committee were unable to form a conclusion, after careful reflection, that the Excelsior was entitled to the preference.

The committee are, therefore, unanimously of the opinion that the Babcock Fire Extinguisher is clearly entitled to the first premium. And that justice demands that we should give to this machine the highest possible recommend as an extinguisher of incipient fires. The test to which it was submitted in our presence fully satisfies us in giving it this praise. The fire which was kindled upon the fair grounds, to demonstrate its efficiency was extinguished in less than forty seconds. In this connection we will add, that we do not intend to disparage the merits of the Excelsior; even should it be admitted that the latter could perform all that the former is capable of doing, the committee could not justly come to a different conclusion, because the Babcock is the original invention. As no provision has been made in the list of premiums to meet this case, the committee would suggest that a silver medal be awarded to the proprietors of the

Babcock Fire Extinguisher, and one of bronze to the Excelsior, with such a design as they may select.

Respectfully submitted,

A. B. BRALEY,
E. A. CALKINS,
J. D. GERMAIN,
Committee.

Class 45.—Silver and Britannia Ware.

Best and largest display gold and electro-plated ware, Osborne & Brain, Milwaukee Diploma
Best gold and silver electro-plating, Osborne & Brain, Milwaukee, Diploma
Best britannia ware made in Wisconsin, Union Britannia and Plate Co., Milwaukee Diploma
Best workmanship in silver, Johnson & Lorenz, Milwaukee Diploma

On examination of the articles presented, the committee find no gold and silver electro-plated ware, made wholly in this state. The britannia and white metal goods exhibited by Osborne & Brain, were made out of the state, but plated at their factory, and we would recommend that the premium be awarded to them in accordance with these facts.

A large assortment of britannia and base metal goods, of an excellent quality, were shown by the Britannia and Plate Co., which are worthy of the premium offered.

Of silver ware we found only one silver goblet, made by Johnson & Lorenz. The workmanship of this was excellent, and we recommend that the premium be given to them.

CHAS. PUESSER,
C. F. MUELLER,
Committee.

Class 46.—Surgical, Dental, Mathematical Philosophical Instruments and Apparatus.

Best display of surgical instruments and apparatus by manufacturer or agent, J. Hendley & Co., Milwaukee Silver Medal
Best exhibition of practical dentistry, with samples of work, W. D. Brown, Milwaukee Silver Medal
Best display of dentistry E. W. Foster, Milwaukee Silver Medal
Best display of mathematical and philosophical instruments and apparatus, by manufacturer or agent, L. Black & Co., Milwaukee Silver Medal
Case artificial limbs, J. E. Gardner, Milwaukee Diploma

E. B. WOLCOTT,
G. N. LEE,
Committee.

Class 47.—Stone Cutters' Work, Brick and other Building Material.

Best specimen slate for roofing, Bowman & Jones, Milwaukee, Vermont slate Honorable Mention
Best specimen drain tile, H. Berthlet & Co., Milwaukee Diploma
Best half-thousand shingles, Luscombe & Pierce, Milwaukee Diploma

Best display earthen ware, by manufacturer, Fred Hermann, Milwaukee,	Silver Medal
Best roofing material other than shingles, John Cummings, Milwaukee,	Diploma
Best lightning rod, J. S. Johnson, Milwaukee, Diploma or	\$10
Tile roofing material, Geo. Cooke, Terre Haute, Ind	Diploma
Paper roofing and sheeting, manufactured by Rock River Paper Co., Mann Bros., Milwaukee.....	Diploma
Stone ware, plain and ornamental, Chas. Hermann, Milwaukee...	Diploma
Marble mantles, shown as samples of artistic carving, N. Merrill, Mil- waukee	Diploma
Marble mantles, shown as stone cutters' work, Moffat & Eccles ..	Diploma
Cement chimney tops and pipe, H. Berthlet & Co., Milwaukee....	Diploma
Stucco work, A. L. Leitch, Milwaukee.....	Diploma
Asphalte concrete pavement, Geo. P. Sherman, Milwaukee.....	Diploma
Stone building material, Robert Pasmore, Grafton....	Honorable Mention
Lumber, Luscome & Pierce. Milwaukee	Diploma

The specimens of slate roofing, from Vermont quarries, by Messrs. Bowman & Jones, were very fine, but the committee regret that specimens from the quarries in the region of lake Superior were not presented. The use of northwestern productions, if of merit, should be encouraged in the north-west.

The display of drain tiles by H. Berthlet & Co., was large and fine.

In shingles, only one specimen was offered, but this was very good. They were true, even and smooth surfaced—made by machinery, showing the perfection to which this important class of machinery has been brought. We would recommend to dealers the encouragement of a better and more perfect production, by use of the best articles. This will be alike beneficial to manufacturer and dealer, buyer and seller.

The specimens of tile roofing exhibited by Geo. Cooke, Terre Haute, Ind., were very fine, fire proof, of great strength, and of a pattern that is convenient to lay on the roof rapidly and firmly, and at the same time has when laid, a good appearance. The weight is 600 pounds to the 100 square feet. The exhibitor purposes to use the clay of which the famous Milwaukee brick are made, as it is a first class material for this tile and can be easily shipped from Milwaukee.

Only one sample of building stone was presented. It is much to be regretted that our valuable Wisconsin quarries were not represented.

The exhibition of Siding, Flooring and Plank, made by Luscombe & Pierce, Milwaukee, was of a rare quality. The siding and flooring were dressed, and the plank in the rough. Of the plank

One piece was 16 feet long, $2\frac{1}{2}$ feet wide and 3 inches thick.

One piece was 12 feet long, 2 feet 9 inches wide and 2 inches thick.

One piece was 12 feet long, 2 feet 9 inches wide and $1\frac{1}{2}$ inches thick.

One piece was 12 feet long, 2 feet 9 inches wide and $1\frac{1}{4}$ inches thick.

All clear, straight-grained, and of the variety of pine known as pumpkin pine. The exhibitors have manufactured since the first of May last over three and a half million feet of this variety of pine.

Your committee refer to this subject thus minutely because Milwaukee has become one of the greatest lumber markets in the world. The total receipts at this port for the year ending August 1, 1870, being the enormous amount of 77,000,000 feet, besides shingles, lath, posts, etc.

With the additional facilities for distribution, by the extension of our railroads, the dealers in lumber anticipate a still greater activity in this important branch of trade, for which Wisconsin is so justly celebrated.

J. M. MAY,

E. J. COOPER,

Committee.

Class 48—Printing Apparatus, Paper, Printing, Bookbinding, etc.

Single and double Composing Stands, N. C. Hawks	Diploma.
Binding, H. Niedecken & Co., Milwaukee	Diploma.
Printing Presses and Printing Material, Bleyer, Parks and Harkness, Milwaukee	Diploma.
Ink Stand, Fred De Vere, agent, Milwaukee	Honorable Mention.
Terrestrial Globes, Outline Maps and Ink Well, A. H. Andrews & Co., Chicago	Diploma.

EDWARD BARBER,

L. E. POND,

Committee.

Class 49.—Textile Fabrics, Clothing, Etc.

Best piece doeskin, not less than 10 yards, Chandler Congdon & Co., Beaver Dam	Diploma
Samples doeskins, (reported by committee as equal to above <i>in manufacture</i> , but of wool not so fine,) McFetridge & Co., Beaver Dam.	
Best piece kersimere or plain cloth, Chandler Congdon & Co., Beaver Dam	Diploma
Best piece blanketing, Isaac Lane, Waukesha	Diploma
Best piece flannel, Chandler, Congdon & Co., Beaver Dam	Diploma
Best exhibition of men's clothing, F. Heitbahn, Milwaukee	Diploma
Twilled white flannel, P. M. Perkins, Burlington, Wis	Diploma
Fancy flannels, Blake & Co., Racine	Diploma
White sheeting flannel, 10-4 wide, Isaac Lane, Waukesha	Diploma
Suit boy's clothing, R. Richman, Milwaukee	Diploma
Assortment woolen yarn, Hilgen & Wittenberg, Cedarburg	Diploma
Display carpets, Bradford & Stark, Milwaukee	Honorable Mention
Display carpets, Goldsmith & Co., Milwaukee	Honorable Mention
Display carpets, Stark Bros., Milwaukee	Honorable Mention
Worsted and fancy shawls, Blake & Co., Racine	Diploma
Ladies cloth, 6-4 wide, Blake & Co., Racine	Diploma
Piece tricot and tweed, Isaac Lane, Waukesha	Diploma

H. FRIEND,

G. H. STEWART,

Committee.

Class 50.—Domestic Manufactures.

Best Rug of any material, P. M. Putman, Oconomowoc	\$2
Best fifteen yards Rag Carpet, D. P. Webster, Mukwonago	3
Best Woolen Stockings, Mrs. M. M. Case, Madison	1

Best Woolen Mittens, Mrs. P. F. Boss, Mukwonago.....	\$1
Best White Quilt, Mrs. R. J. Lane, Waukesha.....	3
Best double Carpet Coverlet, Mrs. P. F. Boss, Mukwonago	3
Best Knit Counterpane, Mrs. Dema Folsom Jones, Milwaukee	3
Second best, Mrs. E. R. Hickox, Milwaukee, (76 years of age)....	Diploma
Best Wrought Counterpane, W. P. Calkins, Waukesha	3
Best evidence of skill and taste in Crochet Work, Mrs. N. D. Fratt, Racine,	3
Best Gent's Shirt, Mrs. Mary Shanks, Milwaukee.....	3
Best pair Cotton Stockings, Rachel Lapham, Milwaukee, (80 years of age)	1
Hand Sewing and Needle work, N. D. Fratt, Racine.....	Diploma

JUVENILES—GIRLS FIFTEEN YEARS AND UNDER.

Best Specimen Darning, S. B. Smith, Douglas Corner.....	1
Best plain Needle Work, Maria L. Park, Dodge's Corner	2

Miss MARY PHELPS,

Miss SARAH PHELPS,

J. H. WARREN,

*Committee.**Class 51.—Millinery, Hair Work, Etc.*

Best and greatest variety of articles of millinery, manufactured by the exhibitor in this state, Mrs. O. E. Meyer, Milwaukee Silver Medal
 Hair work, Chas. K. Muller, Milwaukee Diploma
 Case gentleman's hair goods, A. Suhr & Co., Milwaukee. Honorable Mention.

Ladies hair goods, Miss E. Miller, Milwaukee..... Honorable Mention
 Sample hoop skirts and corsets, A. W. Rich, Milwaukee..... Diploma
 Indelible ornamental stamped work, Mrs. L. L. Cole, Chicago, Ill.. Diploma

MRS. J. I. CASE,

MRS. G. HEWITT,

A. W. PHELPS,

*Committee.**Class 52.—Ornamental Needle and Fancy Work.*

Best silk embroidery, M. J. Hennessey, Milwaukee.....	\$3
Best muslin embroidery, Agnes Farnham, Milwaukee.....	3
Best worsted embroidery, Miss H. Tabor, Milwaukee.....	3
Second best, Miss S. W. Wells, Milwaukee	1
Fire screen, Miss M. Corrigan, Cedarburg	Diploma
Waxwork, Henrietta C. Bartell, Milwaukee.....	Honorable Mention
Mrs. S. P. Key, Milwaukee.....	Honorable Mention
Mrs. S. J. Leigh, Milwaukee.....	Honorable Mention
Lace embroidery, Mrs. H. Bartlett, Milwaukee	3
Preserved flowers, Mrs. M. Duncan, Milwaukee.....	Honorable Mention
Ornamental wax flowers, Mrs. S. J. Smith, Milwaukee. Honorable Mention	
Chenille work, Frankie J. Ross, La Crosse.....	Honorable Mention

JUVENILES—FIFTEEN YEARS AND UNDER.

Best skill and taste in ornamental needle work, Miss Nannie Foley, Butler	2
Best exhibition of fancy needlework, Miss Flora Dunlap, Milwaukee....	3
Best work in wax, Miss J. Barry, Milwaukee.....	2

MRS. WM. P. LYNDE,

MRS. J. O. EATON,

Mrs. H. D. P. BIGELOW,

Committee.

Class 53.—Music and Musical Instruments.

No premiums were offered in this class, but the fine display made by H. N. Hempsted, Milwaukee, the only exhibitor, warranted the award of a Silver Medal.

Class 54.—Works of Art.

The exhibition in this Class was the largest and finest ever made in the state. The society is under great obligations to Mrs. Alexander Mitchell, Messrs. H. N. Hempsted, John Nazro, James Ludington, G. W. Allen, R. H. Adams and many other citizens for their numerous, free and valuable contributions to the art collections, as well as to assistant Superintendent F. A. Lydston, artist, and his local committee—consisting of Geo. B. Goodwin, G. W. Allen, John A. Beecher, E. R. Persons, E. Townsend Mix, Jas. Douglass and W. A. Nowell, all of Milwaukee—for their energetic efforts to insure a worthy exhibition of works of this class, and for their skill and efficiency in executing the delicate and difficult duties assigned them.

To Mr. F. A. Lydston, assistant superintendent, for valuable services rendered, the executive board have unanimously accorded the distinction of a Silver Medal
 Best carving in marble, N. Merrill, Milwaukee..... Silver Medal
 Best carving in wood, C. Hang, Milwaukee Silver Medal
 Best painting in oil, M. Vianden, Milwaukee..... Silver Medal
 Best show of paintings by modern masters, Wm. Ver Bryck, Milwaukee,
 Special Notice
 Two sacred landscapes, F. A. Lydston, Milwaukee Diploma
 Best exhibition of sun pictures, W. H. Sherman, Milwaukee, Silver Medal
 Second best, Hugo Broich, Milwaukee Bronze Medal
 Best exhibition of lithographs, Siefert & Lawton, Milwaukee, Silver Medal
 Engraving, die sinking and letter cutting, C. H. Clarke, Milwaukee, Silver Medal.
 Best exhibition of penmanship and pen drawing, Spencerian Business College, Milwaukee Silver Medal
 India ink portrait and pen drawing, Mrs. J. T. Kavanaugh, Milwaukee,
 Diploma
 Best exhibition of pencil or crayon drawings, E. White, Milwaukee,
 Diploma
 Second best, Master W. O. Lydston, Milwaukee..... Honorable Mention
 Sketches fruit drawn from nature, Miss Fanny Wells, Milwaukee, Diploma
 Needle work picture (Mary, Queen of the Scots), Miss Mary Mahony, Waukesha Diploma

The judges appointed to decide on the merits of the Works of Art, exhibited in Class 54, would respectfully report as follows:

Though the competition in some departments of this class has been quite spirited, and the exhibition perhaps the most creditable ever made by the society, your committee are of opinion that the interests of the art department would be advanced by different and more careful classification. In the Department of Oil Paintings, especially, they would recommend a different classification. For Portraits, Historic Subjects, and Landscape Still Life, three classes; and would advise the withdrawal of premiums for works of old Masters; also, the best show of paintings by Modern Masters,

and the reduction of the value of premiums offered for pen drawing. They would further advise that suitable premiums be offered for first-class water-color drawings; also medals and favorable notice, etc., for designs of buildings, and the industrial arts; one class for artists, and one class for students and amateurs; also premiums offered for models in clay or plaster, by art workmen, of industrial art objects, etc.

Your committee believe that by following out, and completing this line of hasty suggestions, much may be done to advance the interests of the Industrial and fine arts in the state, and to stimulate to honest and painstaking efforts the artists, art-workmen and students in art industries—in whose interest particularly these suggestions are made—and tend to make this department in future more worthy of its name and its important position in your exhibitions.

In closing this report we would thank the gentlemen to whose labors in this department the success of the art department is largely due; also the public spirited citizens who have loaned valuable art works for exhibition. We feel assured that all will be rewarded in the very decided success of this exhibition, and be incited to future exertion and aid in the interest of this department.

MRS. A. MITCHELL,

E. R. PERSONS,

E. TOWNSEND MIX,

Committee.

Class 55.—Miscellaneous Articles.

Pony and Phaeton, Mrs. Alex. Mitchell, Milwaukee Silver Medal
Herbarium, Dr. J. S. Douglass, Milwaukee Silver Medal
Wreath of Seeds and Flowers, Henrietta Beek, Prospect Hill,

Honorable Mention

Case Stuffed Birds. C. W. Harrison..... Silver Medal
Ornamental Shell Work, Mrs. J. Gould, Beaver Dam.. Honorable Mention
Carved Bone work, Geo. W. Scott, Milwaukee..... Diploma
Soda Water Apparatus, Otto Zweetusch, Milwaukee.. Honorable Mention
Model Ship, (glass case) Henry Blyer, Milwaukee Honorable Mention
Glass Basket, Agnes Coulter, Milwaukee..... Honorable Mention
Feather Flowers, John Atiken, Brookfield..... Honorable Mention
Parian Marble and China Ware, Blair & Persons, Milwaukee,

Honorable Mention

Ornamental Wreath, Miss Maria Roberts, Milwaukee.. Honorable Mention
Bird Cage, Anne Hauer, Milwaukee Honorable Mention

N. A. SPOONER,

Mrs. UTTECH,

Miss ALICE DOYLE,

Committee.

Class 56.—Exhibition by Counties.

First premium, Waukesha County Agricultural Society.....\$200

The committee having carefully examined the various articles on exhibition from Waukesha county report with pleasure, that the exhibition is

every way creditable, and is well entitled to the premium offered by the society.

JOHN OGDEN,
JOSEPH CARY,
Committee.

Class 57.—Ladies' Riding.

First premium, Miss Emma DePuy, East Troy, Silver Tea Set, extra plate, six pieces.

Second premium, Miss Emma Ramsey, Pleasant Prairie, Silver Tea Set, Tete-a-tete, five pieces.

Third premium, Miss Elizabeth Tenney, Durham Hill, Gold Bracelet.

J. I. CASE,
MRS. J. I. CASE,
D. W. MAXON,
MRS. D. W. MAXON,
Committee.

Class 58.—Base Ball.

First premium, "Star Base Ball Club," Milwaukee, Silver Pitcher, Waiter and two Goblets.

Second premium, "Alert Base Ball Club," Milwaukee, Silver Pitcher.

By authority of the competing clubs I award the premiums as above reported.

B. SERRY,
Umpire

PRACTICAL PAPERS.

AMERICAN BUTTER FACTORIES AND BUTTER MANUFACTURE.*

From the Journal of the Royal Agricultural Society, England; with corrections and important additions made by the author [for special publication in the Wisconsin State Agricultural Society's Transactions,

BY X. A. WILLARD, A. M., OF LITTLE FALLS, N. Y.

Lecturer at the Maine State Agricultural College and Cornell University, N. Y., etc.

INTRODUCTION.

The American system of associated dairies was inaugurated during the early part of 1851. Though twenty years have elapsed since the plan was conceived, the leading features of the system remain unchanged. Great improvements, it is true, have been made in buildings and dairy apparatus and in the methods of manipulating milk for cheese and butter manufacture; still, in organizing factories, in the manner of delivering milk, in the relation between manufacturer and patron, in the care and disposal of the product,—indeed, in all the general outlines of the system,—it is the same to-day as when Jesse Williams in 1850, mapped it out for the first cheese-factory which he erected early the following year.

After nineteen years' experience in associated-dairying, during which time the system has been put to the severest tests, the American dairyman finds it more economical as regards labor, buildings, dairy machinery, and appliances; while the factory product on an average will sell for enough

*Entered according to act of congress in the year 1871, by X. A. WILLARD, in the office of the librarian of Congress at Washington.

more than that made in the individual farm-dairy to pay the entire cost of making.

Another important result of the system has been a constant improvement in dairy management, and the better knowledge of all that pertains to milk and its products, than would naturally obtain under the old system. It has established a special profession or calling, upon which men enter with a view of making it a sole business. They, therefore, seek to perfect themselves in it, and as skill and success are sure to be properly rewarded in this department of labor, great emulation exists among manufacturers to excel in their art.

During the first ten years of the factory system it received much opposition, especially from those who had only a superficial knowledge of its operations. So strong was this opposition among the old dairymen, that it was pretty generally believed that the system could not long endure, and it was confidently predicted that the factories would be abandoned, and those engaged in them would return to the old plan of individual or farm-dairying.

But the factories, meanwhile, were steadily gaining ground; and dairymen entering upon the new system found in it so much relief, as well as profit, that they could not be induced to abandon it; and so to-day associated-dairying in America has come to be regarded as a fixed institution.

In the original plan of Mr. Williams it was not contemplated to apply the system to butter manufacture. But the success of the cheese-factories suggested to the butter dairymen of Orange county, New York, such a modification of the system as would adapt it to their branch of business.

Orange county lies about fifty miles north of New York city, and has long been devoted to producing milk for city consumption. It is a rolling mountainous region, abounding in sweet and nutritious pasturage, with never-failing springs and streams of pure water. The whole farming population of this county has for eighty years, or more, devoted its chief attention to butter-making and the production of fresh milk for

the New York market. From so long attention to a specialty, the butter of Orange county, as was to be expected, was of fine quality, acquired a high reputation, and commanded better prices than any other brand made in the State. By adopting, however, the associated system, together with a new plan for setting the milk and obtaining the cream, the product has risen to the highest point of excellence, and in consequence extraordinary prices are paid for it.

But the farmers under this system have not only reaped better prices for their butter, they have also obtained an additional gain from the skimmed milk, which, under the old system, was fed to swine, but which now is turned into a palatable cheese. This cheese goes into the southern states; it is shipped to China and the East Indies, and not unfrequently commands a price but little below that made from whole milk.

As the manufacture of skimmed cheese is a part of the butter factory system, we shall speak of it more fully under its appropriate head.

THE GRASSES.

Before entering upon the question of butter manufacture and factory management, it will be proper to say a word concerning the food of stock. The excellence of "fancy butter" does not depend altogether upon its manufacture, for, in the first place, good milk must be secured.

"Fancy butter," that will sell for a dollar per pound, cannot be made from bad material, from milk produced on weedy pastures, or upon the rank sour herbage of swamps, or upon land newly seeded with red clover. The experienced butter dairy-men, therefore, pay much attention to the feed of their cows, and prefer old pastures.

On the old pastures of the butter district there are several varieties of grasses that spring up spontaneously, and are much esteemed as affording sweet and nutritious feed, from which the best qualities of milk and butter are produced. These grasses form a dense solid turf, leaving no intervening spaces. They embrace the June, or blue grass (*poa pratensis*), the fowl mead-

ow-grass (*poa serotina*), meadow fescue (*festuca pratensis*), red top (*agrostis vulgaris*), the wire grass (*poa compressa*), the sweet scented vernal and vanilla grass, together with timothy (*phleum pratense*), orchard grass (*dactylis glomerata*), clover and other forage plants.

The June grass (*poa pratensis*) is regarded as very valuable: it throws out a dense mass of leaves, is highly relished by cattle, and produces milk from which a superior quality of butter is made. It is found growing throughout the butter districts of the country. The wire-grass (*poa compressa*) is deemed one of the most nutritive of the grasses, is very hardy, eagerly sought after by cattle, and is one of the best grasses for fattening. Cows feeding upon it yield milk of the richest quality, from which the nicest butter is made. It flourishes well upon gravelly knolls and in shady places, and its stem is green after the seed has ripened. It is found growing in all parts of the country.

The meadow fescue is common in old grass lands where the sod is thick, and grasses of different varieties are mingled together. It starts up early in the spring, is relished by stock, and furnishes good early feed. The milk farmers hold it in high estimation as a reliable grass, tenacious of life, and not running out like timothy (*phleum pratense*) or clover. The white clover (*Trifolium repens*) springs up spontaneously in the old pastures, and is highly esteemed as giving flavor and quality to butter.

The sweet scented vernal grass grows best upon the moist soil of the old meadows. It starts very early and gives off a very agreeable odor.

We have been particular in naming the grasses which are most esteemed for producing a high priced butter, because a record of long and well conducted experiments has proved their utility. It is possible that climate and soil might so modify the character of these grasses, as to render them less worthy of esteem in other countries than among the butter dairymen of New York. Still, as the experience of farmers noted for

their success in a particular direction, is more or less suggestive and valuable, we give the record as it is.

THE STOCK.

It is claimed by some that the flavor and texture of butter are influenced by the breed of cows. Butter from the milk of Breton and Jersey cows is said to be not only more solid and waxy in texture, but to have a finer aroma than that produced from other breeds. The milk of the Jersey or Alderney cow is exceedingly rich in cream, and has a deep yellow color, as is well known.

But this question need not be discussed here. It will suffice to state that among the butter dairymen of New York but little attention is paid to breeding, and no prominence is given to any particular breed. The herds are usually made up of "the common cow of the country and grade cattle." There is a sprinkling of grade Short-horns, Ayrshires, Devons, and Alderneys, and occasionally a dash of Holstein blood, obtained by crossing thoroughbreds upon the mongrel or common cows of the country. But, as we have remarked, reliance for the most part is had upon the so-called native or common cow of the country for making up the herds.

It is proper that these facts in regard to pastures and stock should be stated, in order that correct conclusions may be drawn, in making up an opinion of what we shall have to say about butter factories, and the character of product they are able to make.

As to the size of herds kept on the farms, they are usually smaller than those in the cheese dairying districts. The herds on an average, we should say, will number about twenty-five cows to the farm. Some farms, it is true, carry from forty to sixty cows, but in the majority of cases the herds are small, ranging from fifteen to thirty cows.

THE SYSTEM OF ORGANIZING FACTORIES.

The plan of organizing factories is somewhat similar to that employed in the cheese districts. The first effort of organization in a neighborhood, generally falls upon one or two persons,

who may be desirous of having a factory where they can deliver the milk from their cows, and have it manufactured. They, perhaps, have examined the workings of some factory, and have become convinced that greater profits are to be realized from the factory system than from the farm dairy, besides relieving the wife and daughter from the drudgery attendant upon butter-making at home. They therefore endeavor to bring their neighbors to the same opinion, and to induce them to join in erecting the proper building, &c. They go and talk with their neighbors, and finally call a meeting at some central point in the neighborhood, when all are invited to come and discuss the advantages and disadvantages of the system.

The cost of erecting a good factory, and supplying it with machinery and dairy appliances, is not far from four thousand dollars, and the farmers of the neighborhood are expected to join together, and pay for the erection of the buildings, in proportion to the size of their farms, or number of cows from which milk is to be delivered. The shares are put at from ten dollars to fifty dollars each, so as to be within the reach of farmers who have but few cows. As a preliminary, a simple agreement, something like the following is drawn up and circulated for signature :

" We, the undersigned, residents of the town of — and county of —, and state of New York, hereby agree to enter into association, for the purpose of erecting and working a butter factory in the said town. And we severally and individually bind ourselves by these presents, on or before the 1st day of —, 18—, to pay to our regularly appointed building committee the several sums set opposite to our names, for the purpose of building and furnishing the said factory. And it is understood and agreed that when the said factory shall have been completed and opened for work, each member of the association is to patronize it by delivering milk for one year, in proportion to the number of cows set opposite his name. The manufactured product of the said milk shall be sold by the regularly appointed agent of the association, and each member shall receive his share of the sales in proportion to the quantity of milk delivered, less the cost of manufacturing, &c. This agreement shall not be binding unless the sum of four thousand dollars and the milk of 400 cows are subscribed.

Name.		Amount.		No. of Cows.
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This is intended to be only a preliminary agreement. After the stock shall have been subscribed, a meeting is called, officers are chosen, and powers are delegated for the erection of the building, and for putting it in operation.

The structure being completed and furnished, a superintendent is chosen, and help hired for running the factory; and the expenses are shared by the stockholders in proportion to the amount of milk delivered. The cost of repairs, additions, &c., from year to year, is added to the expense account.

At some of the factories having the milk of 400 cows, the expense account for labor has amounted only to a fraction above two mills per quart of the milk delivered, and the gross proceeds from sales gave to farmers about 5 1-2 cents per quart wine measure.

THE MILK BUSINESS.

Since the construction of the New York and Erie Railway, which with its branches, traverses the southern tier of counties, large quantities of milk have been daily sent to New York City by regular milk trains, which gather up the milk at the various depots. The milk trains start late in the afternoon, and milk is forwarded but once a day. A portion of the milk is 36 hours old when it arrives in the city. To carry milk sweet in our hot weather for that length of time requires some art in handling, and is effected in the following manner:

The milk, as soon as it comes from the cow, is strained and put in long tin pails which are set in cold spring water, care being taken that no portion of the milk in the pails be higher than the flowing water that surrounds it. These pails are 8 inches in diameter, and from 17 to 20 inches long.

The milk is stirred occasionally to prevent the cream from rising. It is important that the animal heat should be removed from the milk as soon as possible, at least in an hour's time after it is drawn from the cow.

The old method was to cool the milk in the large carrying cans, but it has been found that it keeps sweet longer by dividing it into small quantities, and cooling it in pails as above de-

scribed. The milk stands in pails surrounded by fresh spring water until ready to be carted to the trains. It is then put into carrying cans holding from 40 to 50 gallons. The cans are completely filled, and the covers, which fit closely, are adjusted so that there shall be no space intervening between them and the milk.

In filling the cans, if there is not quite enough milk for the last can, either a little water is added to make it as full as the others, or the milk is kept back and used for other purposes.

These establishments are conducted on the principle of association, and are called creameries—taking that name on account of furnishing the New York market daily with a certain amount of cream. These creameries, managed on the associated system, return to the farmer a much larger profit than he is able to obtain individually. The manager of the creamery not only takes charge of the milk, &c., as it comes in, but sales are effected by him of all milk delivered.

Members of the association deliver milk night and morning, when it is measured and properly credited to them, and no further trouble is had with it on their part.

Usually the city milk-dealers make contracts with the creameries for a certain quantity of milk and cream during the season, or for such time as may be agreed upon.

Payment is made weekly, or monthly, at so much per quart, at the creamery, or at the nearest railway station.

A part of the milk is skimmed and the cream put up in cans, which, when ready for shipment, are placed in wooden tubs made tapering towards the bottom. The space between the cans and tubs is then packed with ice, the covers fastened down, and in this way the cream goes to market, where it arrives in perfect condition.

As fast as payment is made for milk-sales the money is divided among the patrons in proportion to the quantity of milk delivered. All the transactions are kept, of course, in the manager's books, which are at all times open for inspection and investigation.

BUTTER FACTORIES.

The creamery was the first trial of the associated system by the milk dairymen, and out of it grew the butter factories. The country milk-sales, being under the control of the city operators, it was found necessary to devise means to become independent of combinations that were being made from time to time to reduce the prices of milk and cream. Hence the idea of manufacturing the milk into butter and cheese when fair terms could not be made with the milk dealers. The plan proved at once a success, as it regulated the price of milk in accordance with the value of other products of the dairy, and avoided losses that previously occurred on account of surplus milk, which, under the old system, often had to be retained at the creamery.

The Original Factory.—The first American butter factory was erected by Mr. Alanson Slaughter, of Orange county, New York. The main building is a cheap two-storied structure, arranged on a plan similar to that of the cheese factories. On the ground floor are the milk vats, presses, and other appliances for making cheese, while the second floor is entirely devoted to the dry-room, or department for storing the cheese during the process of curing, &c.

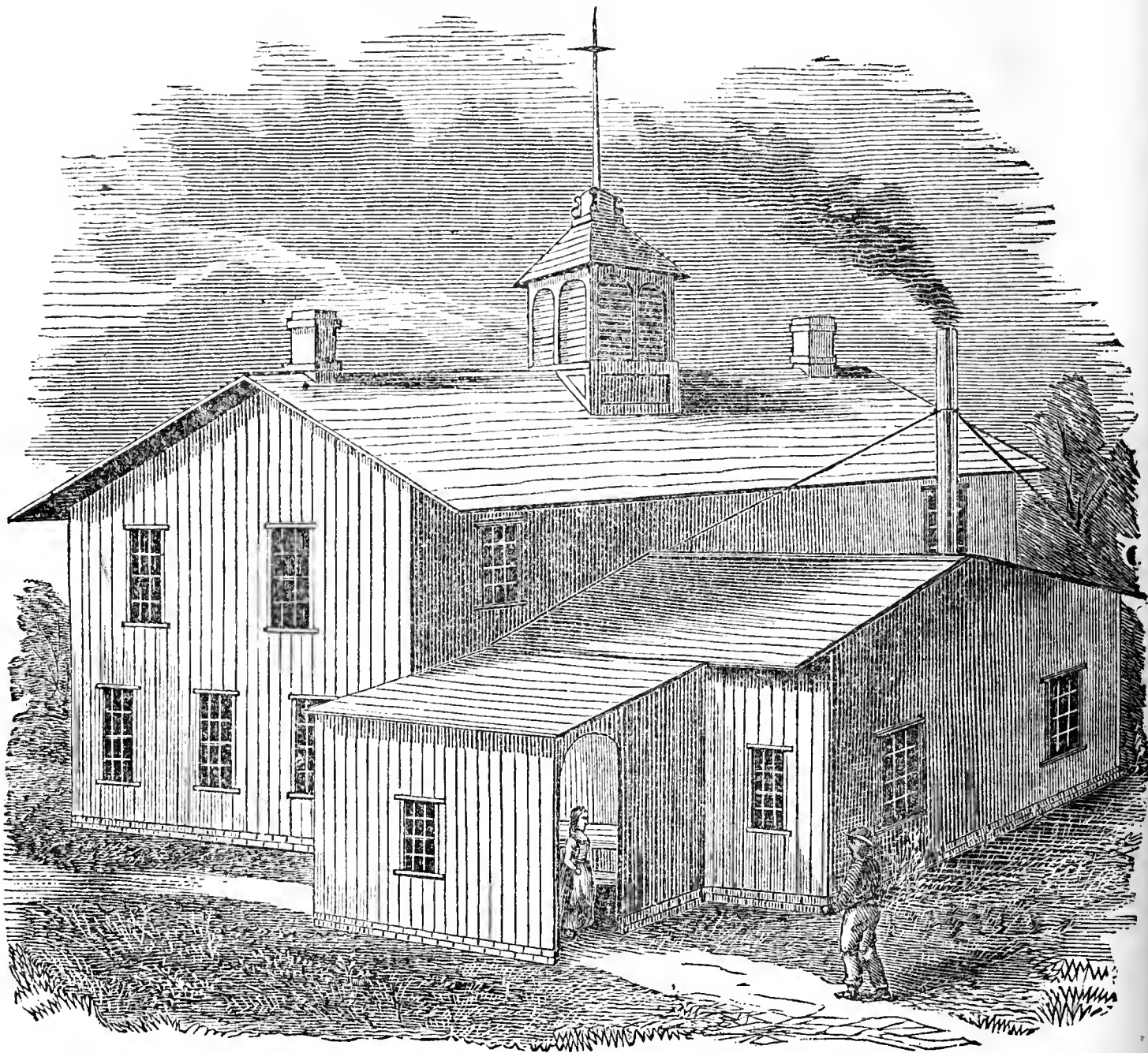
The spring-house is built out upon the end of this structure, forming a wing, and is one story high. It is divided into two rooms, one 12 feet by 16 feet, and the other 14 feet by 24 feet. The packing and churning room is in a separate building, 12 feet by 24 feet, and stands opposite the spring-room, with a narrow alley between. This alley is used for a horse-walk where the teams deliver milk and cart away the products of the dairy. Connected with the packing and churning department there is a horse-gear for churning, and an ice-house and store-room.

THE SPRINGS, AND THE MANNER OF TREATING MILK.

Among the first factories erected, the springs are situated within the enclosure of the spring-house, and vats or tanks

are constructed about the springs for holding the water. These pools are each twelve feet long and six feet wide. The earth is excavated, and the sides of the pool are laid up in solid masonry, or with stout oak plank, so that the water in the pools shall rise no higher than the level of the floor of the spring

Fig. 4—Butter and Cheese Factory.



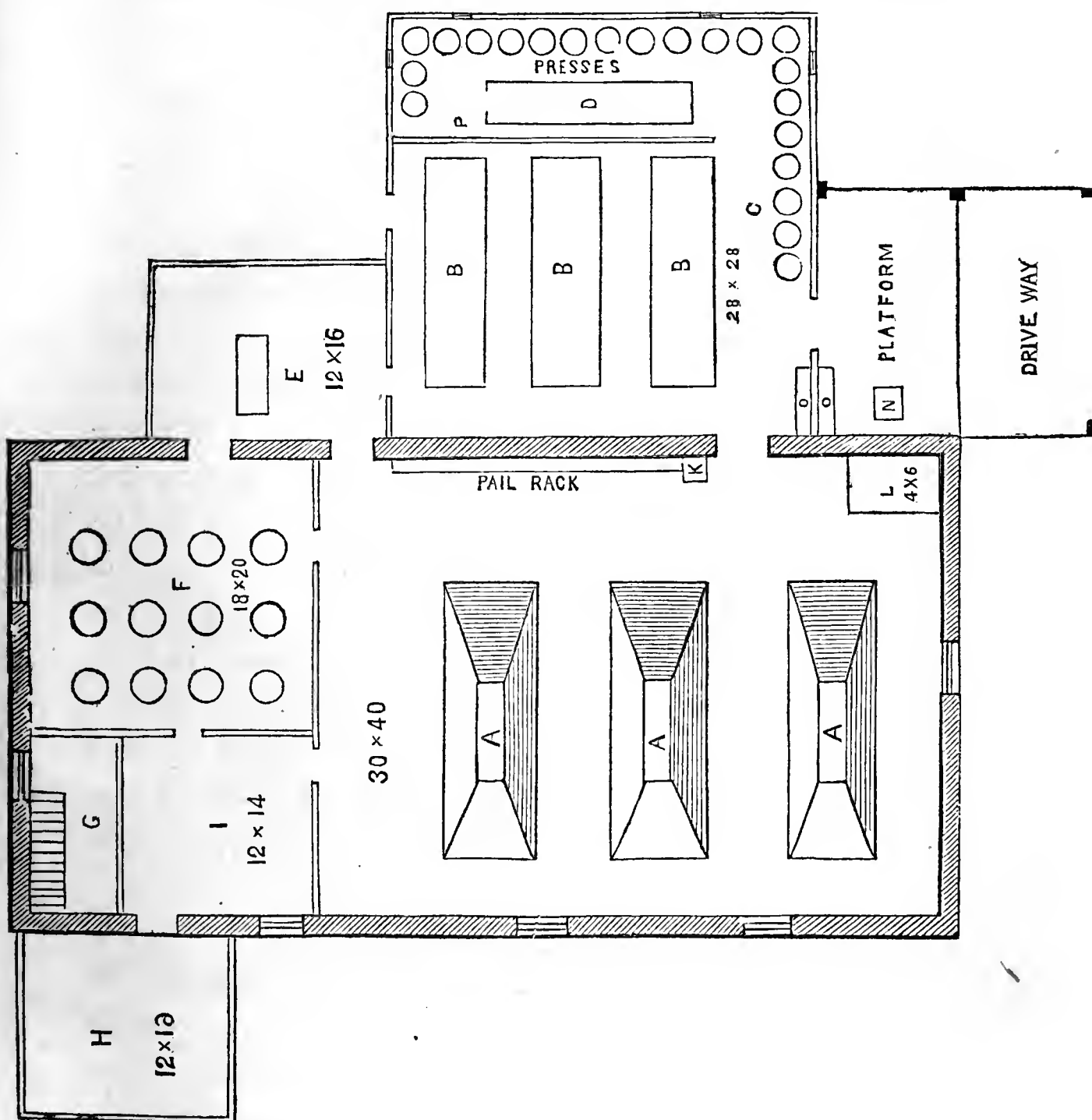
Awarded the Prize by the Northwestern Dairyman's Association.

house. Near the bottom of the pools racks are arranged for holding the cans or pails of milk; the water flows up through these racks and above them to the height of seventeen inches.

When a spring cannot be had in the spring-house, the pools are sunk below the level of the floor and arranged in the same way as above described, except that the bottoms are cemented

tight, covered with flagging or oak-plank, and the water conducted from the spring through pipes. The pails for holding the milk are of tin, from twenty to twenty-two inches in length and eight inches in diameter. In furnishing a factory, two pails are required for each cow's milk delivered.

Fig. 5.—Ground Plan of Thompson's Butter and Cheese Factory.



As fast as the milk is received the pails are filled within four or five inches of the top, and immediately placed in the water. Care is taken that the surface of the milk in the pails is not above that of the water in the pools. The pails are set close together, and each pool has capacity for holding 2040 quarts of milk. There should be a constant flow of water in

and out of the pools, and the flow should be sufficient to divest the milk of its animal heat in less than an hour.

Some experiments have been made with a view of determining at what temperature the water in the pools enables operations to be conducted with the most success; and the best results in cream (quantity and quality considered) are obtained when the natural temperature of the water flowing into the pools is about 56 deg. Fahr. The pools should not be kept at so low a temperature as 48 deg., nor much, if any, above 57 deg. The range of temperature desired by some is from 56 deg. to 60 deg. It is claimed that more cream, and that of better quality for butter-making, may be obtained by setting the milk on the above plan, than it will yield when set shallower in pans, or when exposed to uneven temperatures.

One feature in the process, deemed of great importance, is to expose as little of the surface of the milk to the air as possible, in order that the top of the cream may not get dry, as this has a tendency to fleck the butter and injure the flavor. The milk of one day is left in the pools until next morning, which gives twenty-four hours for the morning's mess and twelve hours for the evening's mess to cream. The pails are then taken out of the pools and the cream dipped off. In removing the cream a little tunnel-shaped cup, with a long upright handle is used, and the thin cream is dipped off down to the milk-line, which is readily recognized by the blue appearance of the milk.

In the fall and spring of the year the cream, as it is dipped, goes immediately to the churns, and is churned sweet. In summer the cream is dipped into the pails and returned to the pool, and kept there till it acquires a slightly acid taste, when it is ready for the churns.

The cream having been removed, the skimmed milk in the pails is now turned into the cheese-vat to be made into "skim-cheese." The pails then go to the wash-room where they are thoroughly cleansed with soap and water, and set upon a rack exposed to the sun and air. At some factories, the pails, after

being cleansed with soap and water, are placed over a jet of steam and thoroughly scalded. They then receive a jet of cold water and go upon the rack to sun and dry. This arrangement is a very great improvement in cleansing dairy utensils, doing the work thoroughly and expeditiously.

The factories do not all operate alike in regard to the time of setting the milk. Where an extra fancy product of butter and skimmed cheese is desired, none of the milk is set longer than twenty-four hours, and at these factories it is not desired to take all the cream from the milk, but only the best part; and the balance is employed to give quality to the "skim-cheese." At some establishments the cream is allowed to turn slightly sour before churning; but when it is churned sweet the buttermilk goes into the vats with the skimmed milk and is made into cheese. Some factories adopt the plan of holding the morning's milk in the pools for thirty-six hours and the night's milk for twenty-four hours; but as the skimmed cheese by this management is less meaty than by the other method, it is a question whether any more profit is realized from it.

THE CHURNS AND CHURNING.

The churning at the large establishments is done by horse-power. There are a variety of powers, but that most commonly used is simply a large circular platform or wooden wheel, built about an upright shaft, the lower end of which turns in a socket. The wheel sets upon an incline, so that the horse, by walking constantly on one side, keeps it in motion. At the upper end of the shaft, gearing is arranged so as to give motion to the churns. Quite recently a small engine in connection with the heating arrangement for the cheese department has been used to supply power for driving the churns.

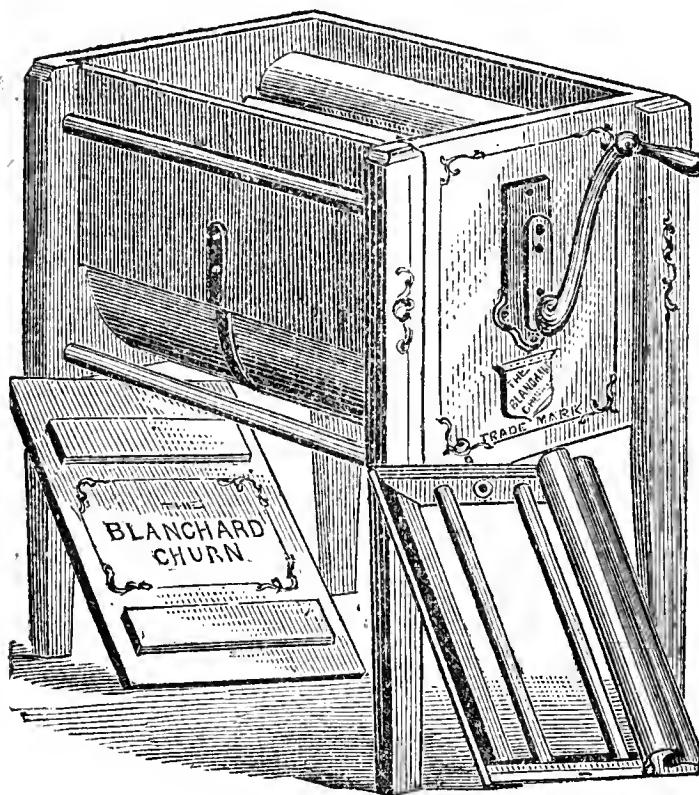
The latest invention for supplying power for churning consists in a system of gearing, driven by a heavy weight attached to a stout rope which is wound about the cylinder of the machine. Sixteen feet of rope will run the power half an hour, carrying the churn-dashers at the rate of fifty strokes to the minute, which is the rate of stroke best adapted for producing

good butter in the dash-churn. It is adapted to any size of churn, and has a regulator to vary the dash without changing the weight.

The "Scientific American," in speaking of the merits and advantages of this machine, says:—"Mechanical powers of this character have not heretofore been very acceptable for domestic purposes, some requiring too heavy weights, and thus using too much rope. The inventor of this movement has produced a churn-power that seems very free from the objections named. It is very compact, occupying a space only of eighteen by twenty inches, applicable for pumping water and many other kinds of light work."

There have been many kinds of churns used in the butter districts, but the factories universally prefer the old-fashioned barrel dash-churn. They use the barrel and a half size with dasher.

Fig. 6.—The Blanchard Churn.



Recently a churn has been invented with revolving arms, arranged so that the floats open and close at each revolution, and it does good work. By an opposite revolution to that used in churning, the floats will work the butter, thus combining a churn and butter-worker in one machine. We give its general appearance in Fig. 6.

Usually, four (of the dash-churns) churns are placed side by side, so as to be all worked by the power at the same time. From sixty to seventy quarts of cream are put into each churn, and each mess of cream then receives from twelve to sixteen quarts of water, for the purpose of diluting it and bringing it to a temperature of about 60 deg. In warm weather cold spring water is used, and in cold weather warm water.

Some prefer diluting the cream with water and passing it through a sieve before putting it in the churns, in order that the particles of cream may all be of uniform size; since if the butter does not come evenly, but is mixed with small particles of cream, it will soon deteriorate, and will not make a prime or fancy article. This point is considered of great importance by the best butter makers, and it is claimed that the method of setting the milk in deep pails, by which a thin cream is obtained, rather than the thick leathery masses skimmed from milk set in pans, renders it more evenly churned, and thus secures a better product. It is partly on this account also that it is preferred to have the churning occupy from half to three-quarters of an hour, since it has been found that when the butter comes too quickly it is more or less injured.

In warm weather ice is sometimes broken up and put in the churn to reduce the temperature of the cream; but it is deemed better to churn without ice, if the cream does not rise above 64 deg. F. in the process of churning, as butter made with ice is more sensitive to heat. It is, however, a less evil to use ice than to have the butter come from the churn white and soft. In churning, the dashes are so arranged as to go downwards within a quarter of an inch of the bottom of the churn, and to rise above the cream in their upward stroke.

The temperature of the cream, while being churned, should be kept below 65 deg.; for if at the close of the churning the butter-milk should be at that temperature or above it, the flavor and color of the butter will be injured. In cold weather, the temperature of the cream, when ready for churning, is a little higher than in warm weather, about 62 deg. being considered the right point. Factorymen prefer that the churning should occupy on an average about forty-five minutes; an half-hour being the shortest space of time, and an hour the longest, that should be employed in this operation. When the butter begins to come, the churn is rinsed down with cold spring water. The butter should come of a firm or solid consistency and of a rich yellow color.

WORKING AND SALTING.

The butter is now removed from the churns, and care is taken never to touch it more than is necessary with the hands. It is lifted with the ladle into elliptical wooden trays, and the buttermilk is rinsed out with cold spring water. In the process the ladle is used lightly, while the water being turned over the butter is allowed to pass off at one end of the tray. This process is repeated two or three times, when nearly all the buttermilk will have been rinsed away.

Salt is now added, and worked through the butter with the butter-worker, at the rate of 18 ounces for 22 lbs. of butter. Great care is taken that the salt be pure, and of those brands that are known to be free from the chloride of calcium, as a trace of this impurity gives a bitter taste to the butter. For butter that is designed to be kept over for the winter markets, a little more salt is sometimes used, often as high as an ounce of salt to the pound of butter. Not unfrequently a teaspoonful of pulverized saltpetre and a tablespoonful of white sugar are added, at the last working, for 22 lbs. of butter.

In the matter of salt, however, the factories adapt the quantity to suit the taste of their customers, or for different markets. Of late years, light-salted butter sells best, and the rate of salting varies from one-half to three-fourths of an ounce of salt to the pound of butter. The butter, after having been salted and worked, is allowed to stand until evening, and is then worked a second time and packed. In hot weather, as soon as the butter is salted and worked over, it is taken to the pools and immersed in water, where it remains until evening, when it is taken out, worked over, and packed. For this purpose a separate pool is provided, which is used only for butter; it is called the "butter pool," and fresh spring water constantly flows in and out of it, as in the pools for setting the milk.

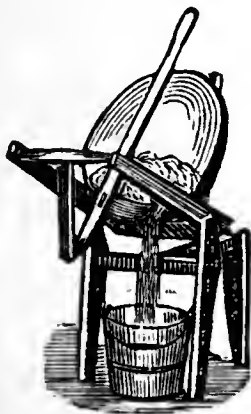
WORKING THE BUTTER.

In working the butter, considerable skill and experience are required that the grain of the butter shall not be injured. The butter must have a peculiar firmness and fineness of texture,

and a wax-like appearance when fractured, which an improper handling, in expelling the buttermilk and working, will destroy. Care is taken, therefore, not to overwork it, nor subject it to a grinding manipulation like tempering mortar, as this spoils the grain and renders the butter of a greasy or salve-like texture.

The butter is worked with butter-workers. The one in most common use consists of an inclined slab standing upon legs, and with bevelled sides about three inches high. The slab is four feet long by two feet wide at the upper end, and tapering down four inches at the lower end, where there is a cross-piece, with a slot for the reception of the end of the lever. There is also an opening at this end for the escape of the buttermilk into a pail below. The lever is made either with four or eight sides, and the end fits loosely in the slot, so as to be worked in any direction. It is quite simple, but does good execution and is much liked at the butter factories.

There are other butter-workers in use, and one of the more recent inventions is represented by the subjoined cuts (Figs. 7, 8, 9.)

Fig. 7.*Fig. 8.**Fig. 9.*

This is a very convenient and efficient machine, the invention of J. P. Corbin, of Whitney's Point, N. Y. The illustrations above give a good representation of it.

A common butter-bowl is placed and held securely on a light, small stool, firmly against a solid rest that protects it from breaking or springing. It may be revolved either way, at will, also easily tipped by a lever to drain off the fluids, and as readily removed from the stool as from a table, and bowls of different sizes may be used on the same stool.

The ladle is attached to a pendant lever that enables a person to press directly through hard butter in all parts of the bowl without drawing or sliding it; also to cut, turn and work it in every manner desired. It is light, strong and simple, everything about it is practical, with nothing to get out of place or order, and it is as handily moved, washed and dried as any butter-bowl and ladle.

The lever is fastened to the slot while the butter is being worked, and is raised up to discharge the buttermilk from the bowl as occasion requires.

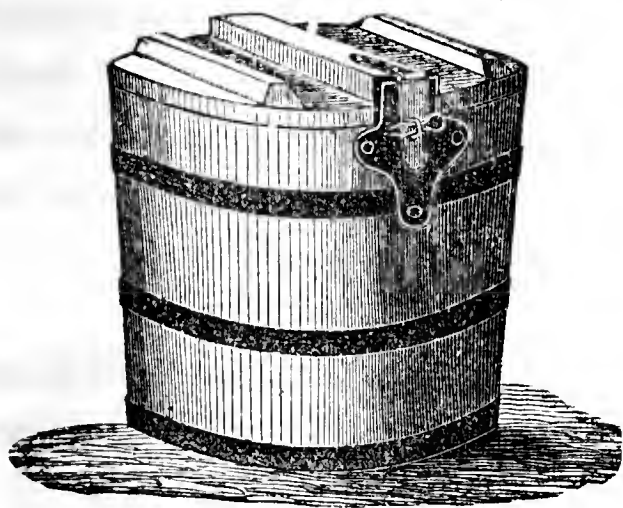
There is a circular iron fastened to the bottom of the bowl, which slides in an iron groove attached to the lever, and which allows the bowl to be moved round, and, when desired, to be removed entirely from the other parts of the worker.

After the butter has been washed in the trays, a batch weighing 22 lbs. is laid upon the inclined slab, or butter-worker, first described, and then spread out with the ladle. Pure Ashton or Onondaga salt, made fine by rolling, is now sprinkled over the mass and the lever applied, first beginning at one side until the whole is gone over. Only a few manipulations of this kind are required to work in the salt and complete this part of the process.

As it is important that the buttermilk should be completely removed, this is facilitated during the working process by applying a slightly dampened napkin to the surface, or by the use of a damp sponge covered with a napkin for the purpose.

PACKING.

The butter is packed in firkins, in half-firkins, and in Orange county pails. The pails are "return pails," that is, they are not sold with the butter, but are to be returned to the factory after the purchaser has taken out the butter. They hold about 60 lbs. of butter, are of white oak, nicely made, and strongly hooped with heavy band-iron. They have movable covers that fit closely, and are fastened with wooden bolts or metallic clasps. The firkins are also made of white oak, heavily hooped, and the sides neatly turned.

Fig. 10—The Wescott Return Butter Pail.

The greatest attention is paid to have the packages perfectly tight, so as not to permit the least leakage. White oak is regarded as the best material for packages, and the butter factories use no other. The firkins hold about 100 lbs. each. The

half-firkin is simply the firkin sawed in two, and provided with an oak head, which is nailed on the top of the package after it is filled.

These pails are made of white oak, and are hooped with iron bands. They are manufactured at Belmont, N. Y

The firkin is prepared for use by soaking in cold water, after that in scalding water, and then again in cold water. It is then either filled with brine and soaked twenty-four hours, or the inside is thoroughly rubbed with dry salt, and left to stand for a short time, when it is considered ready for use.

In packing the butter it is pressed together as solidly as may be, and when the firkin is filled it is immediately headed up, and a strong brine poured through a hole in the top head, to fill all the intervening spaces. The orifice is then closed, and the firkin is set in a cool cellar until it is ready to be sent to market. When the half-firkin is filled, a dry cloth, cut so as to entirely cover the butter, is spread over it, and covered with a thin layer of salt. The cover is then fastened on, and the package is set away in a dry cool place until it is taken to market.

MARKETING.

The butter factories usually have orders for butter as fast as it is made, so that the consignments are from week to week. In Orange county the manner of marketing butter differs from that practised in other localities. Consignments are not generally made direct to the city dealers, but they are intrusted to "captains," as they are called, or persons who make it a busi-

ness to collect freights of this kind, and take them in charge to New York, making the sales and returning the proceeds to the manufacturer. The "captains" go with their freight twice a week, are men of standing and responsibility, who are well acquainted with the trade, and know how and when to obtain the best prices.

They receive a commission for their labors, and find it to their interest to make good sales, otherwise they lose the confidence of those entrusting freight to their charge, and are liable, therefore, to be displaced. The captains often receive proposals for large lots of butter, which proposals are submitted to the factories, when they are accepted or rejected as seems best to the parties interested. They supply private families and hotels, and by having a line of customers who are willing to pay a high price for an extreme fancy article, very large returns are not unfrequently made to the factories.

By this system, the producer being brought near to the consumer, he must realise full prices for his goods, instead of feeding a class of middle men, each one of whom will take his profit out of the product.

With factories quite remote from the city, the product is either consigned to the wholesale dealer, to be sold on commission, or the brand, having a reputation, is sold directly to city dealers, on contracts for weekly or semi-monthly deliveries.

ADVANTAGES OF BUTTER FACTORIES.

The advantages of butter making on the associated dairy system over that in private families are very great. In the first place, by the association system a uniform product of superior character is secured. Every appliance that science or skill, or close attention is able to obtain, is brought to bear upon the manufacture, and prime quality necessarily follows as a result.

If you could assume that in a neighborhood of 100 families each family had the skill and convenience of the factory, and that each would give the subject the same close attention, then, doubtless, there would be no difference as to the quality of product; but such a state of things rarely exists.

Again, the factories are able to obtain a larger price, because it costs the dealer no more to purchase the one hundred dairies combined than it would to purchase an individual dairy, and the uniformity and reliability of the product does not entail the losses that are constantly occurring in different small lots by reason of inferior quality. The factories, too, as we have previously remarked, relieve the farmer and his family from a great deal of drudgery, and unless the work can be done by members of the family, who cannot be employed profitably at other labors, it is a matter of economy to have the butter and cheese made at the factory, since what would take one hundred hands scattered over the country to do, is performed in the same time by three or four, when the milk is worked up together in one place.

The only serious complaint against the factory-system is in hauling the milk. This has been obviated in many instances, by establishing a route of milk-teams, where milk is delivered for the season by the payment of a small sum.

THE SKIM CHEESE.

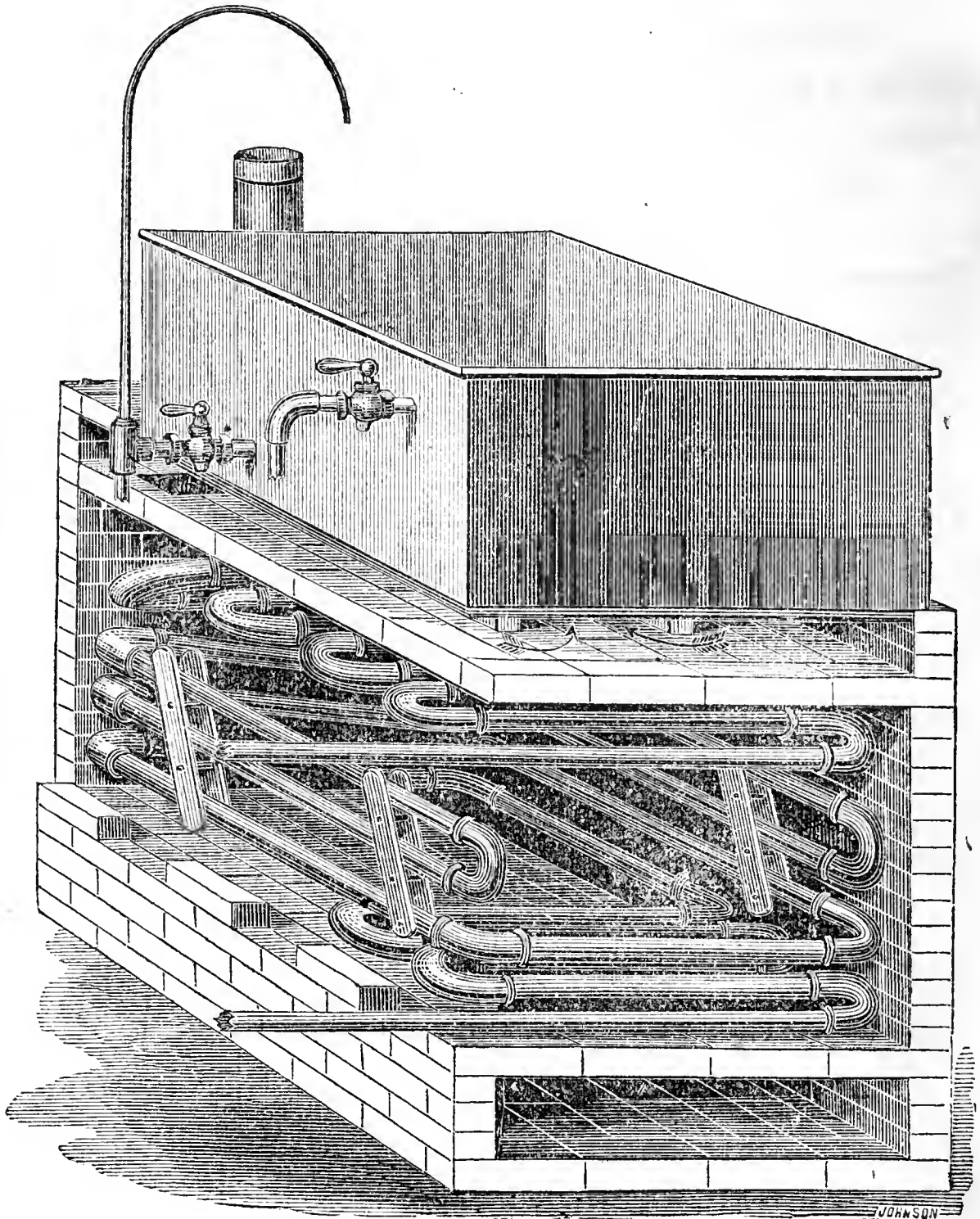
We have referred to the manufacture of "skim cheese" as a part of the butter-factory system. We have said that the cream is dipped from the milk while it is sweet, and that the latter then goes into the milk-vats for making "skim cheese."

It should be remarked that at the butter factories the quantity of milk to be manipulated is usually much smaller than at the cheese factories. In making a fancy product it is found advisable that the delivery of milk be kept within moderate bounds, say from three hundred to four hundred cows. The factory milk-vats are all essentially alike in form and size. They hold from five hundred to six hundred gallons.

There is a great variety of heating apparatus, boilers, steamers, tanks for hot water, and what is termed "self-heaters," that is with fire-box attached to, and immediately below, the milk-vat. This kind of heater is very popular at the butter factories, as it consumes but little fuel, is easily managed, and does as good work as the best.

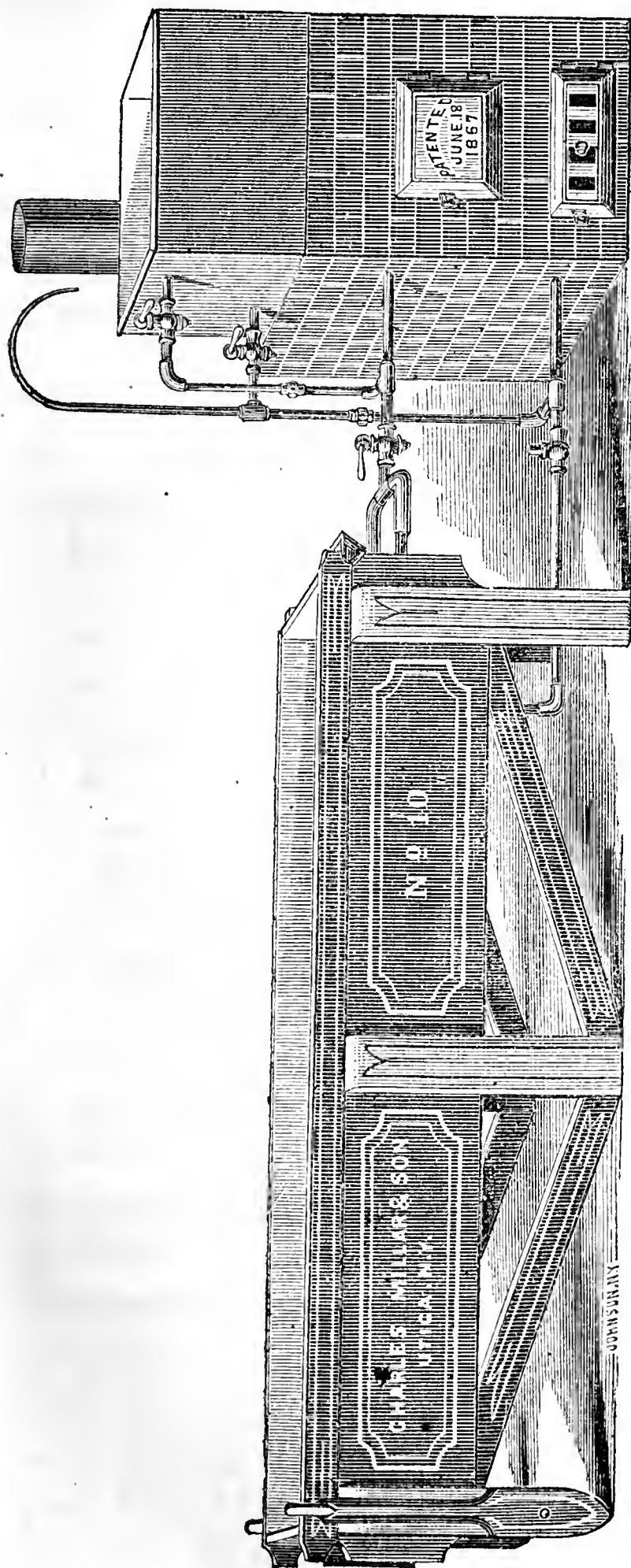
The ordinary heater is constructed separately from the vat, and consists of wrought-iron pipes, screwed together in such a manner as to form a fire-chamber, and present a large amount of heated surface.

Fig. 11.—View of Millar's Heater, with Front and Side of Brickwork removed.

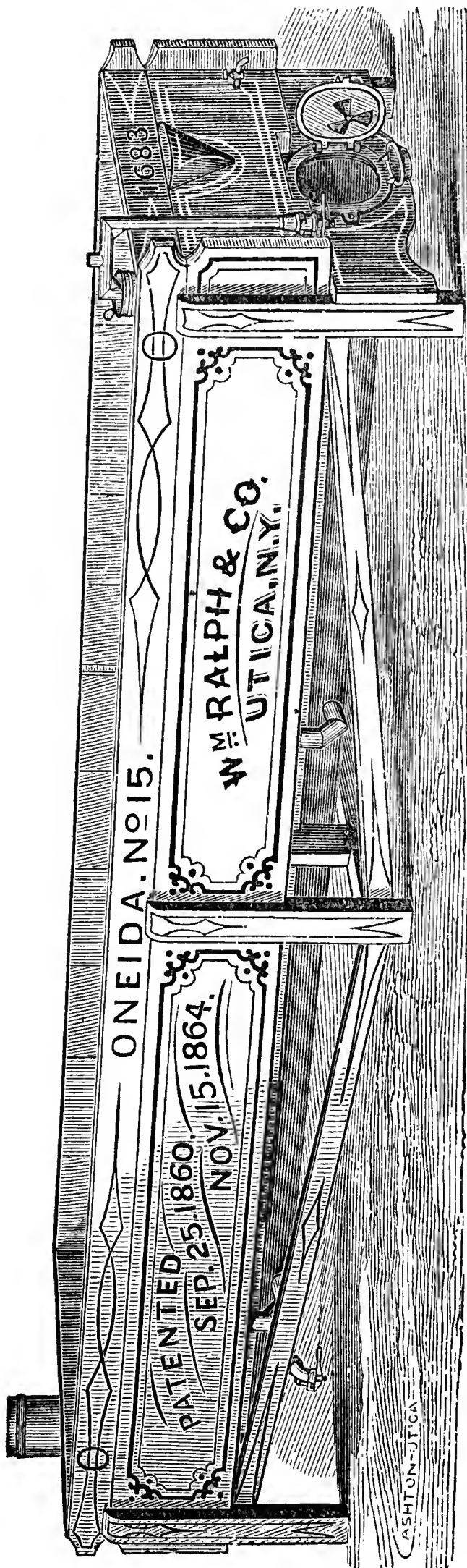


When a boiler and engine are used, power is afforded for driving the churns, and in this respect this system must prove most convenient. Still as the expense is considerably more than for the self-heater, both in the first cost and for fuel, many prefer the latter. We give figures of two kinds of heaters that are very largely in use.

Fig. 12.—Millar's Circulating Coil-Heater for Factory Milk-vat, (consisting of coil of gas-pipe enclosed in brick

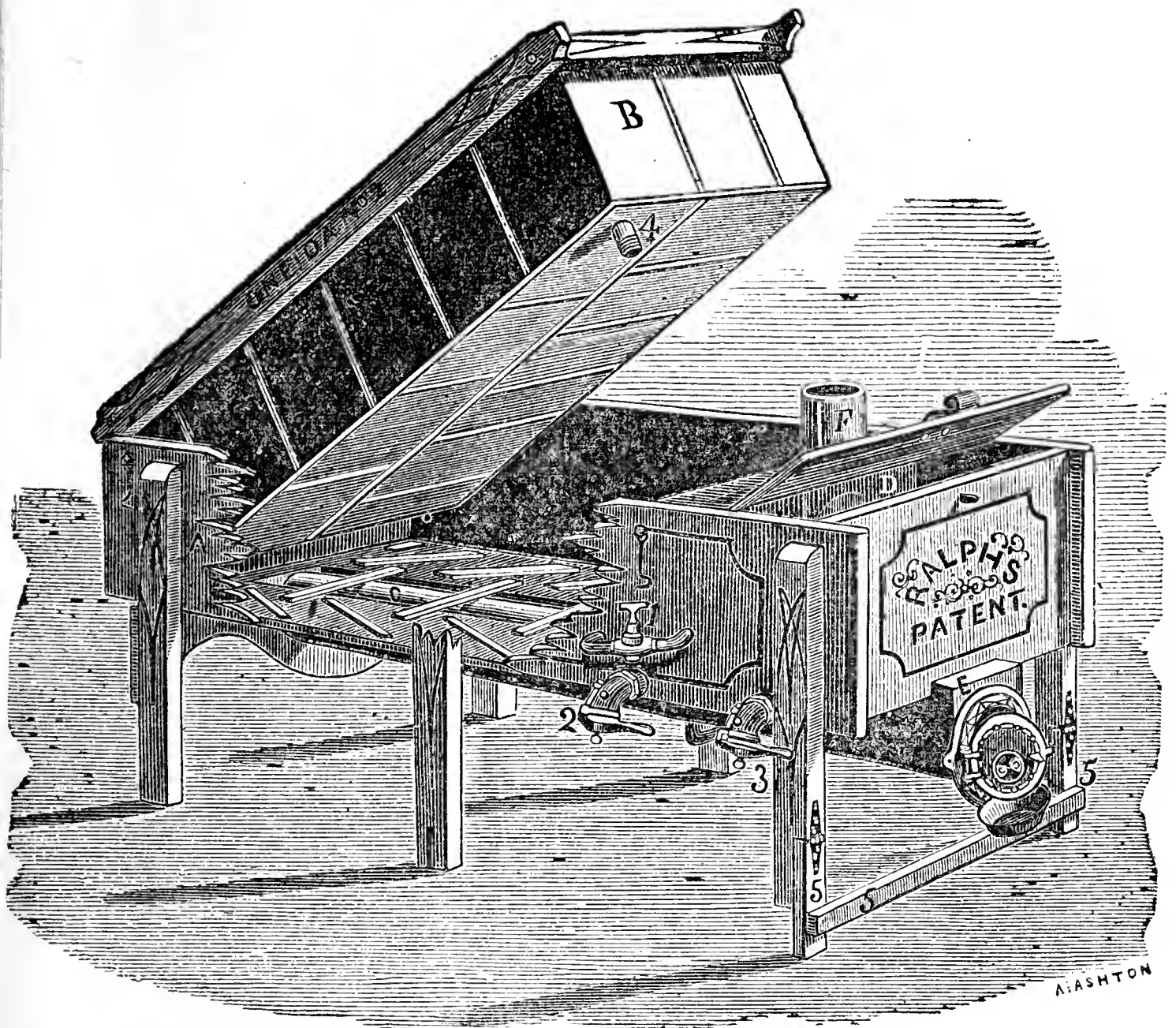


The factory vat (Fig. 13) is constructed on the same principle as that for farm dairies. The fire-box underneath runs from end to end. It is simply a copper cylinder with a jacket two inches or more from cylinder on lower side, so that water surrounds the cylinder or fire-box. This vat requires but very little fuel. I have one of the farm vats upon my farm, and my farmer, in summer has done all the work in making cheese from my dairy of 30 cows, using only a "pan of chips," say 10 to 12 quarts. The pipe hanging over the vat is a movable syphon for drawing off whey. It is represented with one end inserted in the tin strainer, which is also movable, or so as to be detached. B is the smoke pipe.

Fig. 13.—The Oneida, or Factory Vat.

The next engraving (Fig. 14) represents the tin or inner vat raised, and the sides of the outer vat broken out to show the heater and the supports of the inner vat.

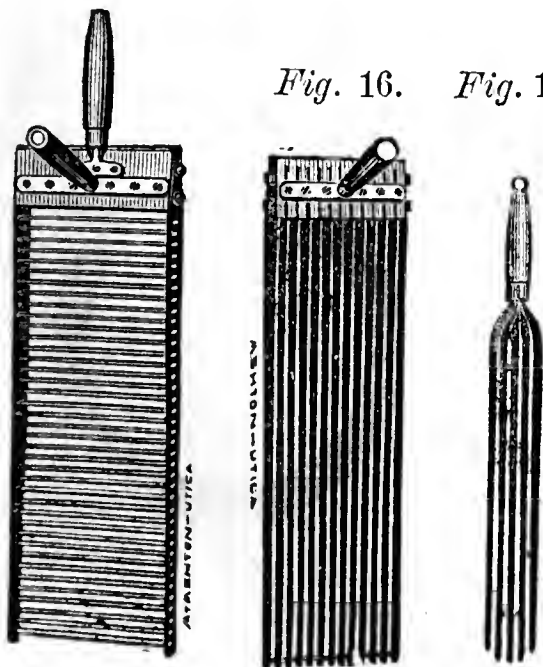
The outer vat is lined with galvanized sheet-iron; B is the inner tin vat; C the copper vat heater, extending the entire length of the vat, and surrounded by water in a semi-cylindrical jacket open at the top, which water also fills the space between the vats. D is the tank or reservoir for hot water, separate from that between the vats, and E the copper heater for tank or reservoir. F smoke-pipe for both vat and tank heaters. The numbers indicate the following parts: 1, faucet connecting water-space between the vats with tank. 2, water-gate in outside vat. 3, water-gate in tank. 4, tube through which the whey is drawn from the strainer inside the inner vat. The strainer and whey faucet are not shown in the engraving.

Fig. 14.—Interior of Milk-vat, with Heater beneath.

The above milk-vat is for farm dairies. There is another door or fire-box at the back, similar to that at E, where fire is made to heat the water under the vat (B), when in place.

Fig. 15.

Fig. 16. *Fig. 18.* In making skim cheese the milk is set at 82 deg., and sufficient rennet added to coagulate it in from forty to sixty minutes. It is then cut in cheeks with a gang of steel knives, the blades set one quarter inch apart.

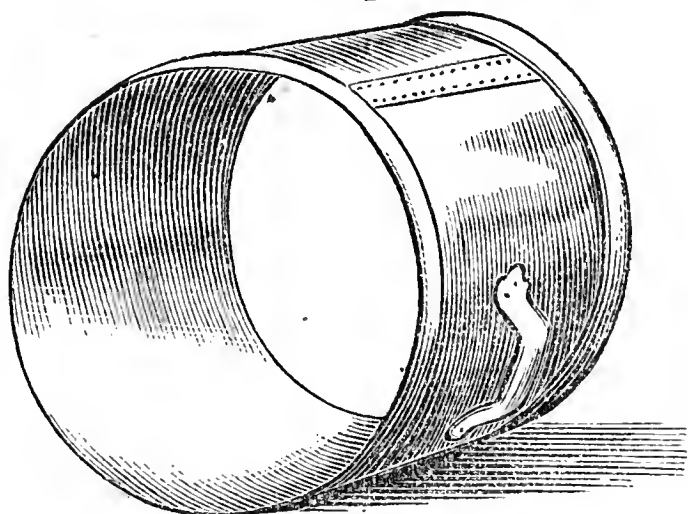


It is now left at rest for a short time for the curd to subside, when it is further divided,

the gang of blades being set at an angle of 45 deg. with the bottom of the vat. It is now gently lifted with the hands, and the process of breaking or subdivision completed. Then a slow heat is begun to be applied to the mass; the curd, meanwhile, being stirred to keep it from packing, until a temperature of 96 deg. is reached. This is the highest heat to which the curds are subjected.

When the curds have acquired a sufficiently firm consistency, the whey is drawn, and the curds thrown upon a sink to drain and cool, after which they may be run through a curd mill and salted, and then put to press.

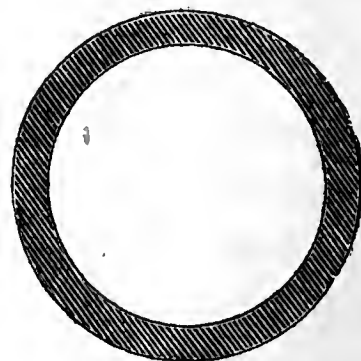
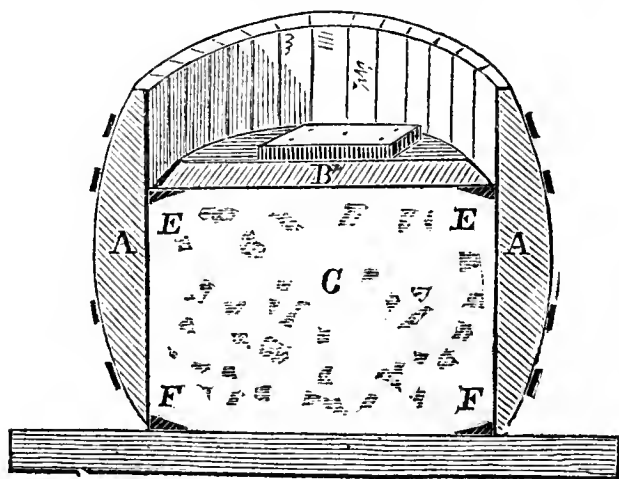
Fig. 18.—The Iron Clad Company's Metallic Hoop.



This metallic hoop is an improvement on the wooden hoop, as it allows a close fitting follower, and is not liable to fall to pieces when out of use as with the wooden hoop, on account of shrinkage of the staves and loosening of the band irons.

The rubber ring is an improvement for keeping the edges of the cheese smooth and in good order while pressing. It has now been thoroughly tested. It prevents the curd from pressing up around the follower of a cheese hoop, and takes the place of press cloths.

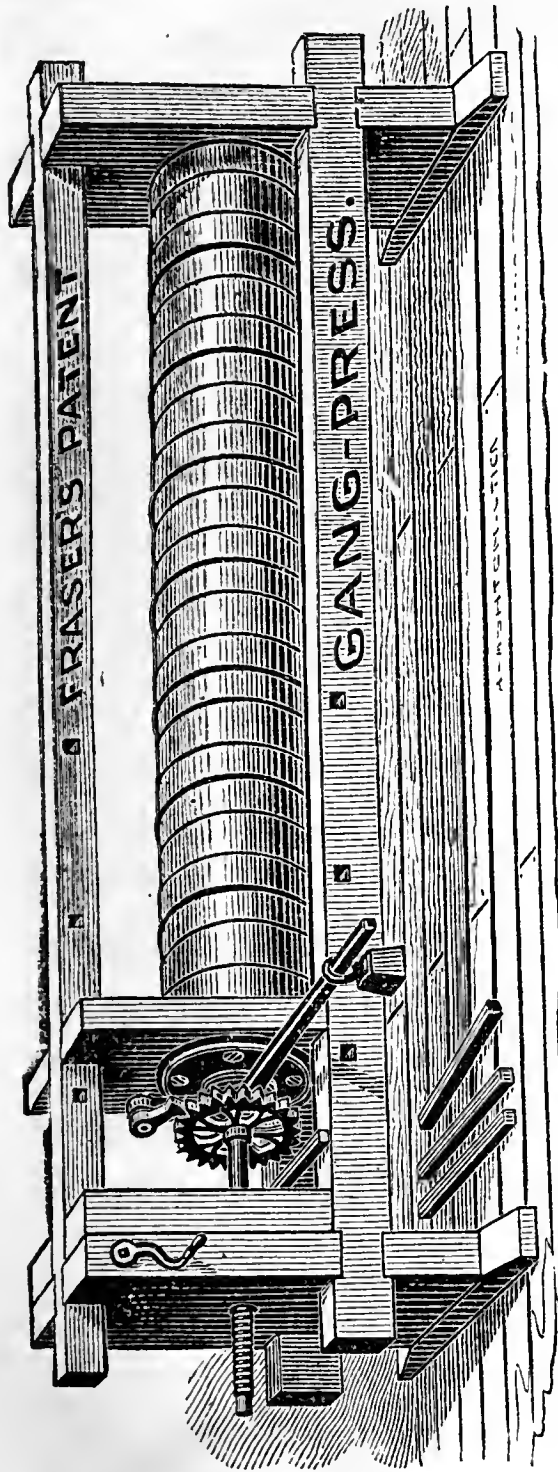
Fig. 10.—Millar's Hoop and Rubber Ring.



The above cut represents a cheese hoop cut in too perpen-

dicularly. A, represents the cheese Hoop; B, the Follower; C, the Cheese; E and F, the Rubber Washers or Rings. One of these Rubber Rings is placed on the inside of the cheese hoop resting on the press board below the curd or cheese.

Fig. 20.—The Fraser Gang Press.

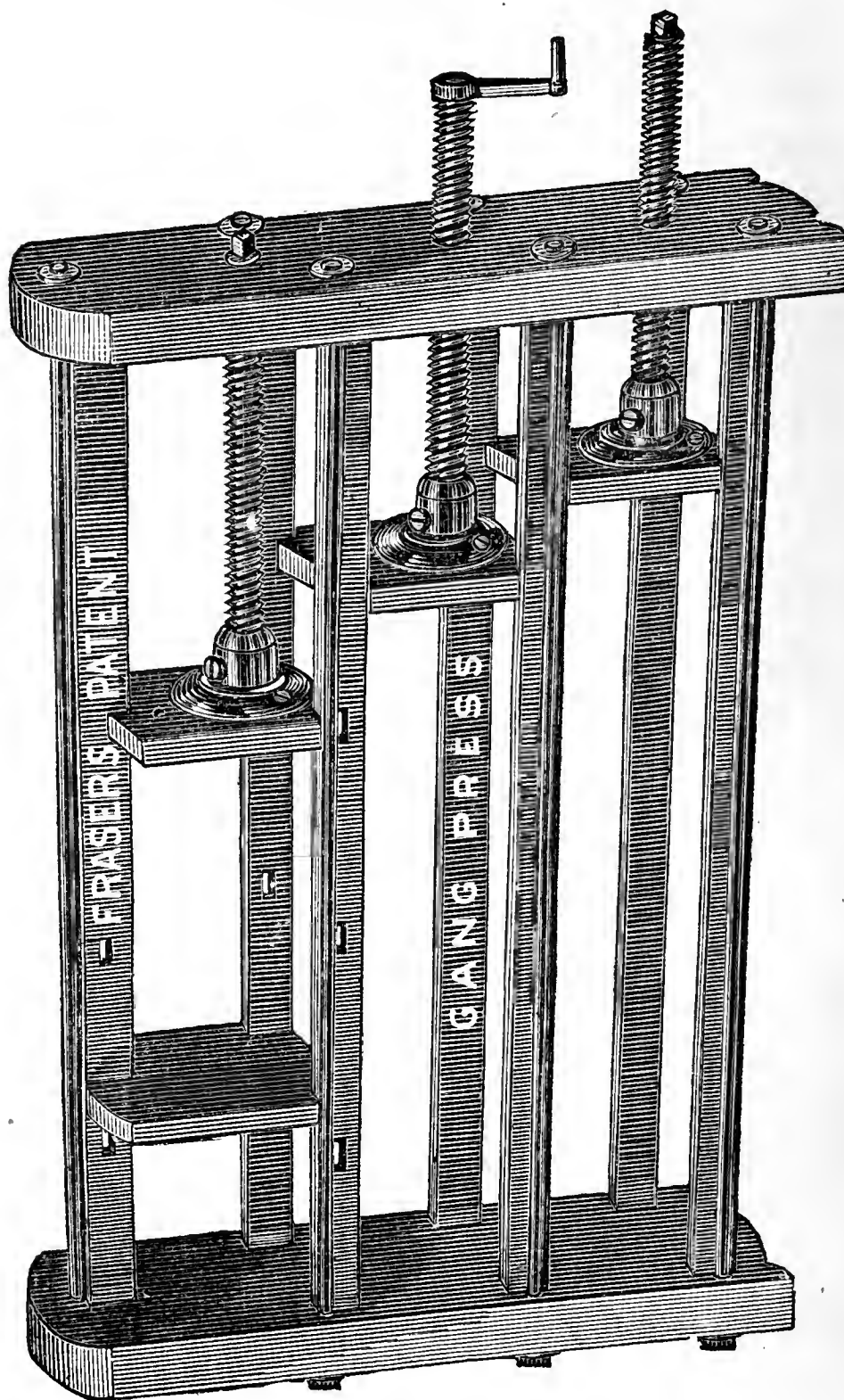


The other is placed above the cheese, directly under the follower. As soon as the pressure is applied it causes the Rubber Rings to expand and fit tight to the hoops, preventing the curd from pressing either up around the follower, or out underneath the bottom of the hoop.

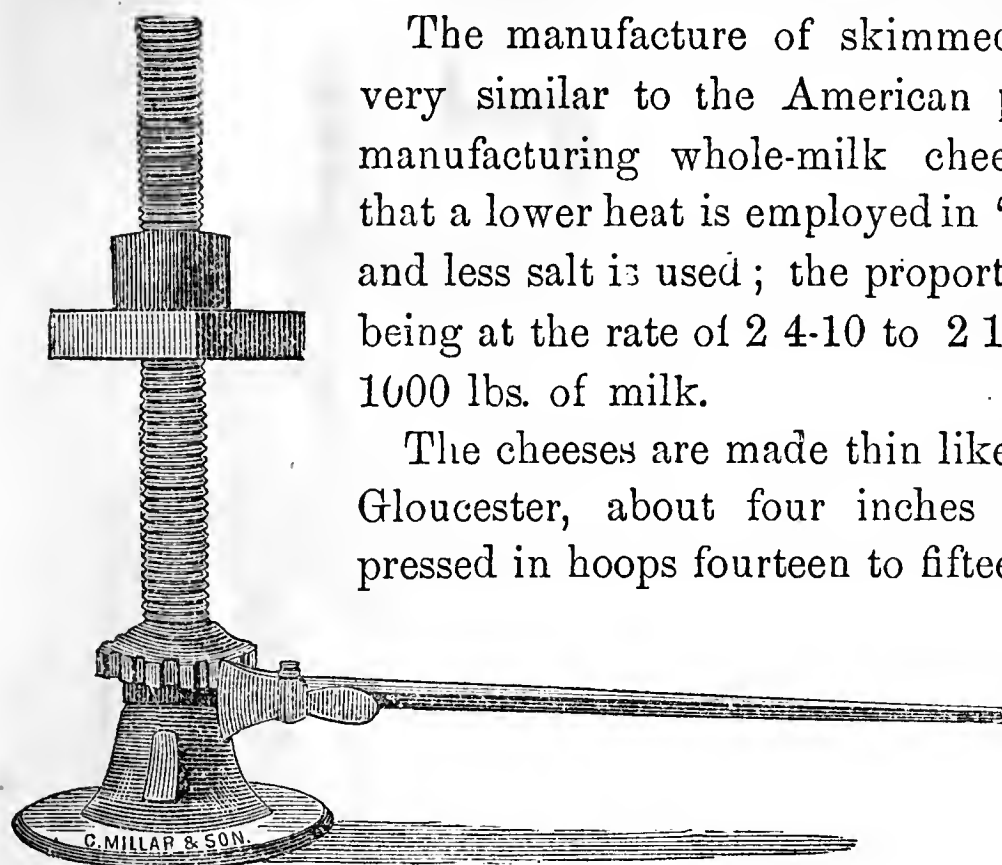
By using these rubber rings the followers may fit the hoops very loosely. They are more convenient than press cloths, are more readily cleaned, and will last much longer. They are made beveling, so they leave a nice rounding edge on the cheese, and save all trimming.

Directions for Using.—Cut the ring once and then fit the rings to the hoops, and if there is any lap cut it out, so that the ends just meet when the ring is fitted closely to the sides of the cheese hoop. Place one at the bottom of the hoop, fill in the curd and put another under the follower. It is

not necessary to use any press cloths, though some prefer to use circular cap cloths. If the cheese hoop fits closely to the press board, the lower ring is not always necessary. Several small holes should be made in the cheese hoop, to allow the whey to readily run off.

Fig. 21.—The Fraser Gang Press.

The Frazer gang presses are a new invention and are much liked where they have been tried. D. H. Burrell, Little Falls, N. Y., is general agent for them.

Fig. 22.—The Millar Patent Ratchet Cheese-press Screw.

The manufacture of skimmed cheese is very similar to the American process of manufacturing whole-milk cheese, except that a lower heat is employed in "scalding," and less salt is used; the proportion of salt being at the rate of 2 4-10 to 2 1-2 lbs. for 1000 lbs. of milk.

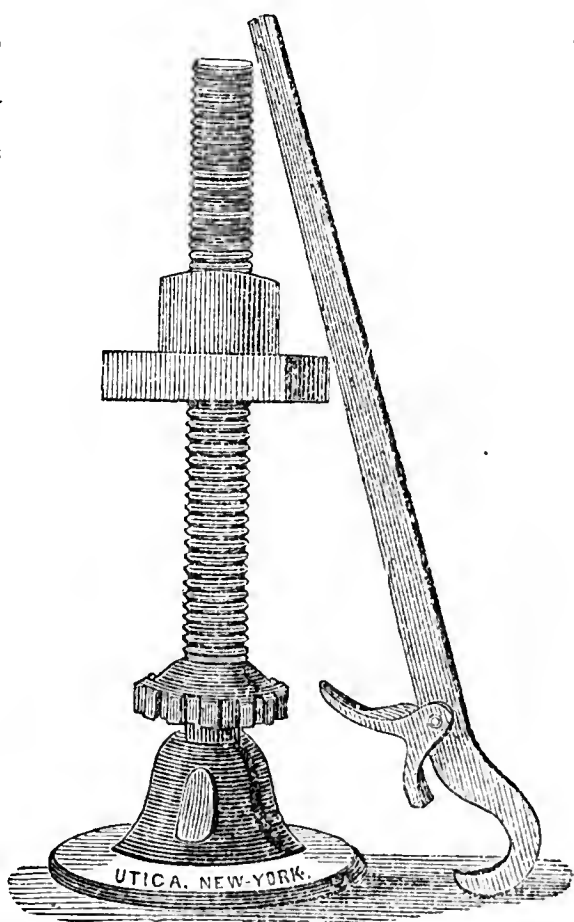
The cheeses are made thin like the single Gloucester, about four inches thick, and pressed in hoops fourteen to fifteen inches in diameter.

The style of cheese, however, varies at

different factories; some making a small sized fancy shape, eight to ten inches in diameter, and about the same height.

The Oblong Shape.—Recently a new form, or style of cheese, has been introduced, which promises to be a success. The advantages claimed for it are—

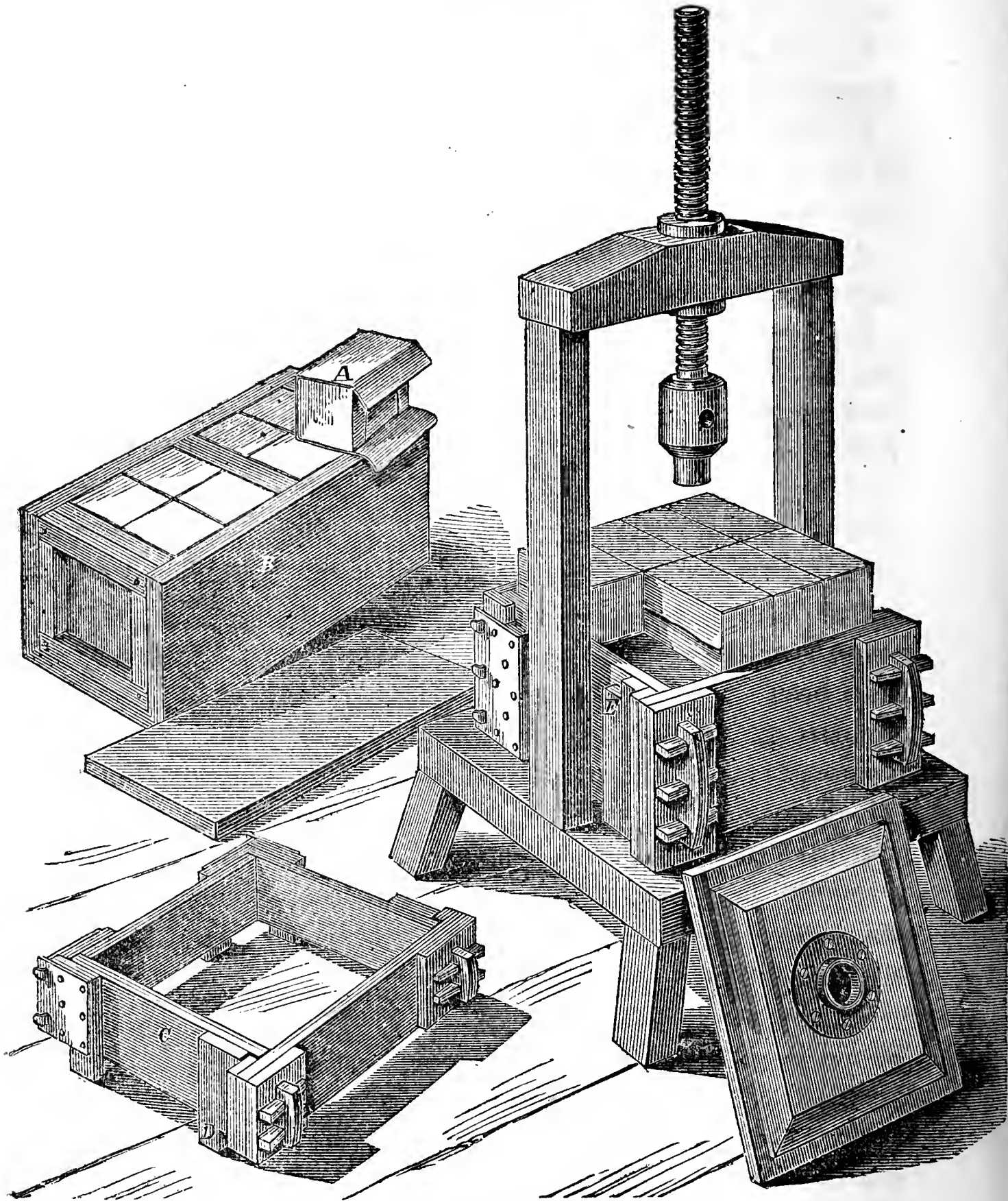
1. The curd is pressed in a large cake (pressing in one curb or mould from ten pounds to one thousand or more) and then cut into blocks of any desired size. These blocks are then bandaged, and placed in the mould in layers, and again pressed, and the whey starts again, especially at the freshly cut sides. In this manner cheeses may be made weighing

Fig. 23.

from ten to one hundred pounds each, to suit any market, and

small cheeses can be made at very nearly the same expense as large ones.

Fig. 24.—Cheese-press and Mould used for the Holdridge Cheese.



A. Cheese with bandage. B. Composite Cheese-mould. C. Square Hoop.
D. and E. Morticed slips for connecting the Hoops.

2. The escape of the whey by evaporation is greatly facilitated by this form of cheese-cakes, for, as the whey percolates

towards the bottom of the cakes (these cakes being turned from time to time only a quarter of a revolution), the whey, instead of turning back toward the centre of the cheese—as is the case with all round cheese—is turned at right angles thereto, and is consequently always tending towards the outside; and the whey is so far expressed and evaporated that decomposition is much less liable to take place.

3. These cakes, being entirely covered with bandage, may be cured with or without greasing, and are thus rendered safe from flies.

4. They are much more easily turned and handled than round cheese.

5. They are shipped to market in boxes of thin stuff of any kind of timber. Any farmer can make them, making the boxes of such size as he chooses, and at an expense much less than for round boxes. For ten-pound cheese, boxes are used with success containing 18 cheeses, 180 lbs.; and for thirty-pound cheeses, 8 in a case, 240 lbs. This item of boxes is a great advantage. The boxes are solid, and there are no covers to come off. The cleats on the outside of the boxes prevent them from being packed too closely together in carrying or in store-houses. There is a great saving in weight, as, in the old style, down weights are given in each cheese, while in this shape only one down weight is given for 18 small cheeses or 8 large ones.

6. For retail trade this form of cheese is of great advantage. The dealer can weigh the whole cheese, and cut by measure the exact weight required, and many of the cheeses are sold without cutting.

7. For family use small cakes are a great success. A ten-pound cheese is 10 inches in length and 5 inches square, and is cut for table use as follows:

Turn the bandage back from the end, cut a thin slice from the end of the cheese, then cut off the desired slices for the table, and replace the thin slice and bandage; set the cheese on end and it is sealed, and as safe as an uncut cheese.

8. These cheeses cure much better than round ones, as the gases, if any be generated, escape from the ends, and are not forced back and forth through the cheese as with round ones.

9. They take less room in the dry-house, and women and children can easily turn and handle them.

10. For exportation they greatly excel the round cheese. They can be packed closer, boxes cost less, and small cheese can be boxed and shipped at nearly the same expense as large ones. They have been shipped to England with great success.

When curd is ready for pressing it is placed in the mould E. of a square or rectangular form and with one side arranged to open by removing pins at the corners. After the curd is pressed into a broad flat cake it is vertically cut with a firm saw into blocks as represented in cut, and bandaged with muslin. These are placed one upon another in layers, say two deep in the mould, with thin boards or other plates between them, and are again subjected to the action of the press, by which the whey is still further pressed out, especially of the freshly cut sides of the cakes. The pressing is continued as long as needed, after which the cakes are removed to the shelf or curing-room, to allow the remaining whey to escape by evaporation. This is claimed to be facilitated by the form of the cake, because, as the whey percolates towards the bottom, and in turning as is required, from time to time, the cakes are only turned a quarter of a revolution, the whey instead of being turned directly back in its course is turned at right angles, and is consequently always tending nearer to the exterior.

In this way, together with the pressing, it is claimed the whey is so far dissipated that decomposition is much less liable to take place, and therefore, the cheese may be preserved without the greasing commonly employed.

BUTTER-MAKING AT THE CHEESE FACTORIES.

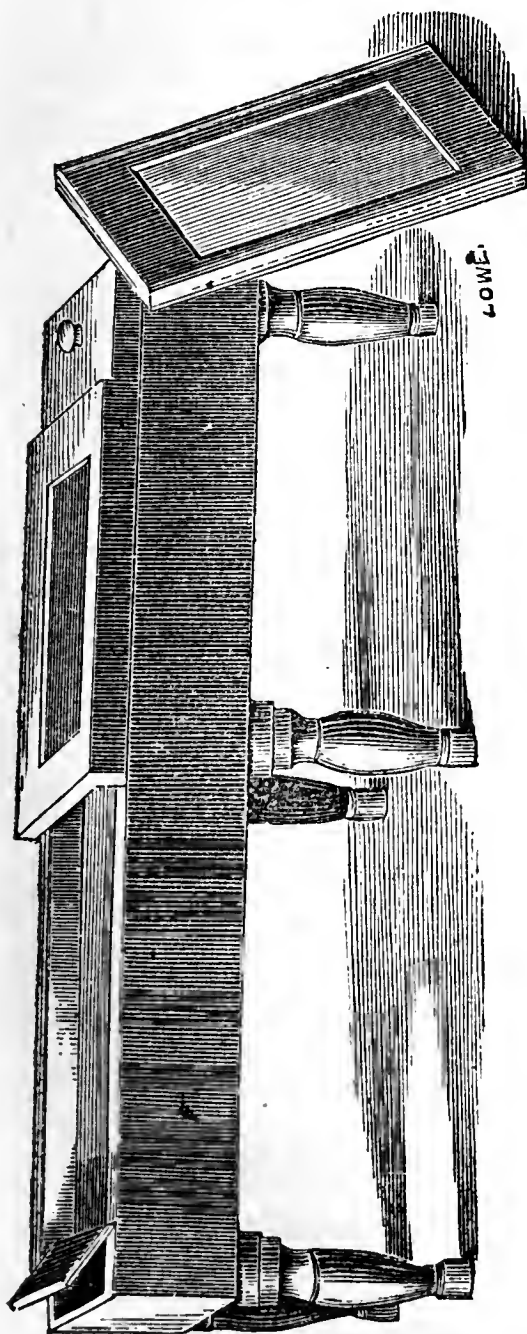
Within the last three or four years a good quality of butter has been made at some of the cheese factories. The plan adopted is to spread out the night's milk in the vats used for making

cheese, allowing a stream of water to flow under the inner vat, or to fill the space between the inner and outer vats. The milk is by this means reduced to about 60 degs. and what cream rises during the night is skimmed off in the morning and made into butter.

The morning's milk is then added to the skimmed milk as it comes to the factory, and is made into cheese by the usual process, except that a lower heat and less salt is used than for the whole-milk cheese.

By careful manipulation and skill, very nearly, if not quite, as good a product of cheese is made as at the factories making whole-milk cheese; at least, with good milk and high skill, experts are unable to detect the difference.

Fig. 25.—C. F. Jennings's Milk Pan for Setting Milk, fitted with movable Covers of Netting to keep out Dust and Flies.



At one of these factories, which we visited in 1870, the delivery of milk for the day amounted to 6,839 lbs. The cream taken from the night's mess of milk made 87 lbs. of butter, and when the morning's milk was added to the skimmed milk it made 9 cheeses of 72 lbs. each.

In some factories, in order that the night's milk may not be massed together in too large quantities, resort is had to a large shallow pan set in a wooden vat with space between the two for water. The milk is set in these pans from 2 to 3 inches deep, and a stream of cold water kept flowing in the space between the pan and the vat during the night

These pans are from 8 to 12 feet, or more, long, by 2 to 3 feet

wide, and are arranged so that the milk may be drawn off through an orifice in the bottom. The skimming is effected with a tin scoop.

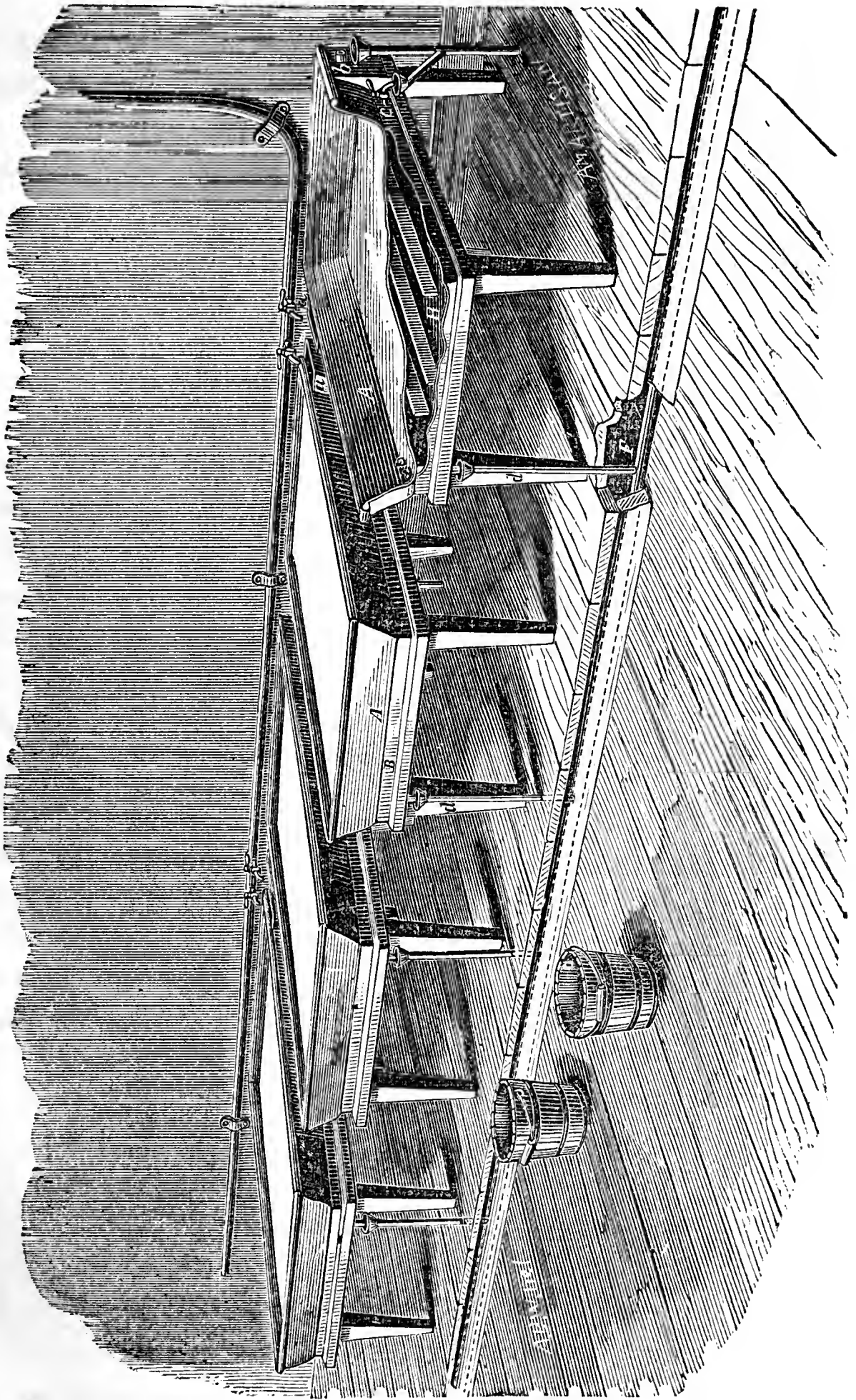
The above figure (25) will illustrate this apparatus. It does its work very effectually.

THE JEWETT PAN.

The Jewett pan is somewhat similar in construction to the Jennings Pan, and the same principles are involved in its operation. I have tested the *Jennings pan* in my own dairy, and am well pleased with it; and I believe these pans are a very great saving both in labor and product over the old system of setting the milk in small pans. They can be made of any desired size to accommodate the entire mess of milk from a moderate sized dairy. Usually, one surface foot of pan bottom will be sufficient for two cows; so that any one may calculate pretty accurately what will be needed for his dairy. The sides of the pan are about five inches high.

In farm dairies, where the milk rooms are not constructed on the Orange county plan, or that described for making Philadelphia butter, these pans serve a very important purpose, since the milk, by means of running water, may be kept at a pretty even temperature in an ordinary, or less expensive milk room. The way to use them is to put one milking of the entire dairy into one pan, adjusting the faucet in the supply pipe so as to use just water enough to extract the animal heat from the milk, and keep it at the desired temperature while the cream is rising—say from 60 to 62 deg. At the time the fourth pan is wanted for use, the first will be ready to skim; then stop the water from running into the pan that a sufficient quantity of water may run out while the milk is skimmed, and run off to enable the milk-maid to clean the pan.

The American *Artizan* thus describes the following cut of the Jewett pan:

Fig. 26.—The Jewett Pan.

“As given in the engraving, one of the series of pans, A A is represented as broken away to show the internal arrangement. These pans are provided with a space, B between their

top and bottom walls. Within this space are a number of compartments communicating with each other at alternate ends, in such a manner as to form one continuous channel, zigzag in its course, having an inlet at *a*, through which warm or cold water, as needed, is received; such water, after flowing through the tortuous channel formed by the partitions, being discharged at the outlet *b*. At *b* is shown the opening through which the overflow of water is discharged; the object being to keep the channel in the bottom of the pan quite filled while the water is flowing through it. At *c* is shown a faucet through which all the water in the channel can be drawn off.

When the cream has raised and has been skimmed, the milk is then run off through the pipe *d*, which communicates with the main discharge pipe, *F*, which may be placed under the floor or not, as circumstances will permit; or if desired the milk can be conveyed in movable horizontal pipes from the pans into an adjoining room on the same floor. The pipe seen attached to the side of the room and above the row of pans is the source of supply from which water is conducted to the base of the pans. For cooling, the water is received from a spring or reservoir; but for warming, from boilers or other appropriate apparatus.

WHEY BUTTER.

At the whole-milk cheese factories a new process is beginning to be adopted for taking the butter out of whey and preparing it for table use. Whey butter is not equal in flavor or texture to the fancy product manufactured at the butter factories. Still, by the new process, whey butter may be made very palatable, and, when fresh, commands a good price.

We have seen whey butter side by side in the markets with that made from cream in the usual way, and dealers have selected the former in preference to the latter, not for a moment suspecting its origin. Indeed, so fine are some of the samples, and so neatly are they put up, that it has been sold week after week at the Little Falls market for the same price as good brands of butter made in the farm dairies.

Whey butter soon deteriorates in flavor, and should be consumed when freshly made. We give description of apparatus and process of making as follows:

Apparatus.—The apparatus is a copper-bottomed vat 12 feet long by 3 feet wide, and 20 inches deep. These dimensions may be varied to accommodate the size of the dairy. The vat sets over a brick or stone arch, and is accommodated to the use of 18 or 20 inch wood. The floor is a slightly inclined plane towards the back of the vat. The vat and arch should be placed a little lower than the milk-vat so as to enable the whey to be easily drawn off by means of a syphon.

The process.—After drawing the whey from the curd into the vat over the arch referred to, one gallon of acid is added to the whey for every 50 gallons of milk, if the whey is sweet. If the whey is changed a less quantity will be sufficient, and if the acid is not sharp, one pound of salt should be incorporated with it.

The acid having been added in the above proportions, heat is immediately applied to the mass until it indicates a temperature of from 170° to 180° Fahrenheit. The cream now begins to rise, and is skimmed off with a tin scoop; and when it has all been removed it is set in a cool place, and left to stand for 24 hours. It is then churned at a temperature of from 56° to 68° , according to the temperature of the weather, and is then worked and salted in the ordinary manner of butter-making. This process gives on an average 20 pounds of butter from 500 gallons of whey.

Making the Acid.—The acid is made by taking any quantity of whey after extracting the cream, heating it to the boiling point, and adding a gallon of strictly sour whey for every 10 gallons of boiling whey, when all the casein and albuminous matter in the whey will collect in a mass, and may be skimmed off. The whey is now left to stand for 24 or 48 hours, when it will be ready for use as acid.

After the butter is made by the above process, the whey is

considered by those who have made experiments with it, to be better for feeding to swine than whey not subjected to the process, as the sugar of milk is retained longer without change.

RESULTS OBTAINED AT THE BUTTER FACTORIES—LABOR, ETC.

The average product from the milk during the season at the butter factories is a pound of butter and two pounds of skim cheese from 14 quarts of milk. There is a variation in the quality of milk at different seasons of the year; and in the fall, when the cows are giving a smaller quantity, it is, of course, richer in cream, and better results are obtained from the same quantity than early in the season. This will be seen from the following examples of a single day's work, taken at random from the book of one of the factories:

On May 18th, from 3512 quarts of milk, wine measure, there was produced 213 lbs. of butter and 560 lbs. skim cheese. On May 26th, from 3,300 quarts of milk, 210 lbs. of butter and 550 lbs. of cheese. On September 12th, from 3,180 quarts of milk, 200 lbs. of butter and 546 lbs. of cheese. On October 14th, from 2,027 quarts of milk, 120 lbs. of butter and 407 lbs. of cheese.

In the working of any system, practical men always desire statistics of results. The following is a statement of receipts and expenditures at one of the small butter factories, where a portion of the milk was sold.

The quantity of milk received from April 10th to December 1st, was 627,174 quarts, of which 27,308 were sold at a little above 7 cents per quart, leaving 509,866 quarts to be made up into butter and cheese. The product was as follows: 31,630 lbs. of butter, 81,778 lbs. skim cheese; 15,908 lbs. whole milk cheese; 2,261 quarts cream sold at 19 6-10 cents per quart, and 1,561 quarts skim milk, at 15 cents per quart.

The net cash receipts, after deducting transportation and commissions were as follows :

For pure milk sold.....	\$1,926.22
For skim milk sold.....	24.02
For butter sold	13,344.21
For skim cheese sold	11,659.08
For whole-milk cheese.....	1,065.44
For 2,261 quarts cream.....	443.33
Hogs fed on whey.....	446.24
Buttermilk and sundries	207.49
Making total of.....	<u>\$29,116.03</u>

The expense account was as follows :

For labor.....	\$1,476.40
For fuel.....	79.96
For cheese boxes	653.17
For 20 sacks of salt.....	89.25
For rennets, bandages, &c.	483.55
For carting cheese and butter to station	273.10
Paid for hogs.....	179.90
Total.....	<u>\$3,235.33</u>

This gives an aggregate net receipt of \$25,880.70.

From these statements it appears that the butter averaged 42 1-4 cents per pound, the skim cheese 14 1-4 cents, and the whole-milk cheese 18 cents per pound, while the average amount received on the whole quantity of milk was 4 1-10 cents per quart. The whole expenses of the factory were a little over one-half cent per quart.

For working this factory there were employed, besides the superintendent, three hands, viz., two men and one woman. The labor account for conducting this factory, it will be seen, is a little over two mills per quart.

MEANS EMPLOYED FOR DETECTING DILUTED MILK.

The most unpleasant feature of the factory system appears when dishonest patrons attempt to rob the association by the delivery of watered milk. The laws of New York are very severe on persons found guilty of this misdemeanor, punishing with heavy fines and imprisonment. The factory manager keeps watch over the milk as it is delivered, setting aside small quantities from time to time for observation and experi-

ment with the hydrometer. Each factory is also provided with a set of small glass tubes, upon which the names of the patrons are pasted. As milk is delivered a small sample is placed in the different tubes corresponding with the name of the patron, and set aside. If the milk is not all right, the hydrometer and these samples give warning; the milk is then subjected to a more careful test, by the use of the cream-gauges and per cent. glass, which are represented in the following figures.

Instruments for Testing Milk.

Fig. 27.

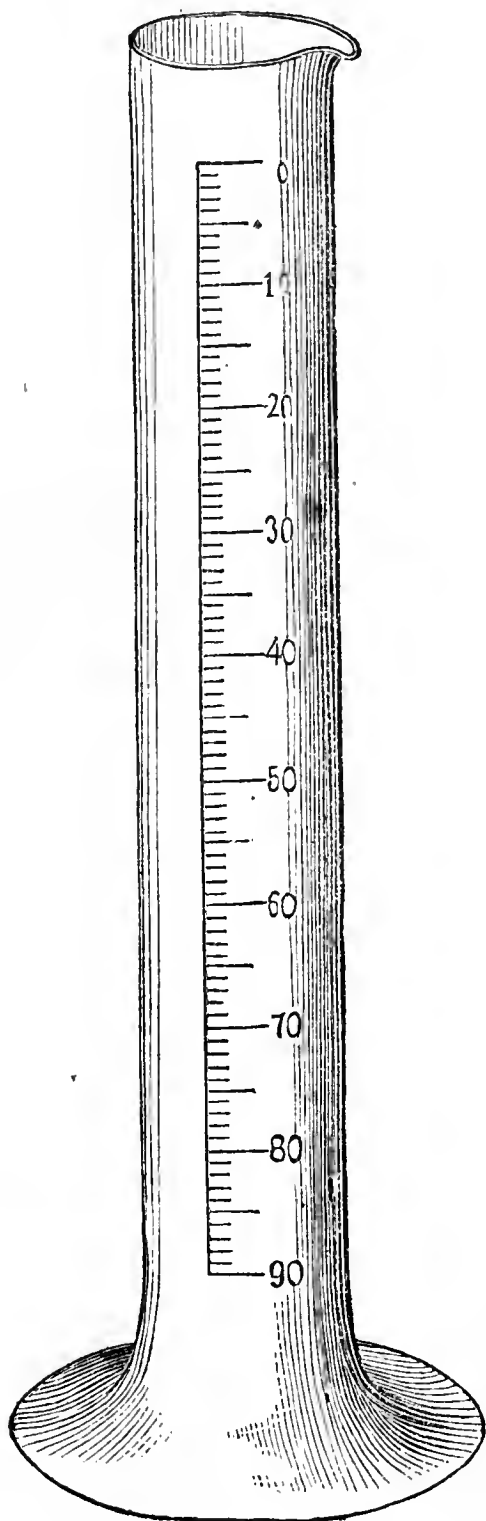


Fig. 28.

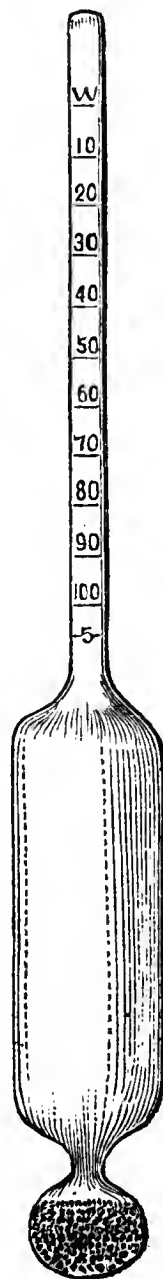


Fig. 29.



In testing, one of the cream-gauges is filled to gauge-mark 10, with milk known to be pure, and drawn from several cows. This will be the standard for pure milk for that day. Another gauge is filled to the same number (10), with milk from a can which you wish to test. To avoid any mistake, the first jar containing pure milk is marked with the letters P. M. on the side or bottom. The jars are set away side by side, a sufficient length of time for the cream to rise. Now note the quantity of cream in each. If a less quantity is found on the milk you are testing than on the other, it indicates dilution, or skimmed milk. Now remove the cream from each with a spoon, introduce the hydrometer (or "lactometer," as it is usually called) into the jar marked P. M., and note on the scale-mark when it floats. Then remove it to the other jar, and note also when it floats. If it sinks lower than in the first jar, the evidence is considered almost positive of dilution with water. Replace the lactometer in jar marked P. M., from per cent. glass filled with water exactly to nought or zero pour into P. M. jar until the lactometer sinks exactly to the same point as in the other jar. Now count a number on per cent. glass from zero down (each mark represents one-half of one per cent.) and you will have precisely the per centage of water with which the milk you are testing has been diluted.

Although there may be considerable variation in the specific gravity of milk from different cows, it has been found that when the milk of several cows is mingled together, and when the milk of different herds of a neighborhood are compared, there is but little difference in the specific gravity of the several samples.

These tests have been very effectual in bringing offenders to justice, and with the very strict law on the subject, very little trouble is now had on account of adulterated milk.

ANNATTOINE.

The butter factories prefer to give color to their butter by having the cows well fed, and by getting up the cream as

quickly as possible after the milk is drawn. Sometimes, in winter, a little coloring may be used, and for this purpose as well also as for coloring the cheese, nothing has given so much satisfaction as annattoine, or the dry extract of annatto recently introduced.

The modes of preparing annatto for commerce are various and intricate. M. Le Blond, a French chemist, gives an account of its manufacture as follows ; he says :

The pods of the true *Bixa Orellana* being gathered, their seeds are taken out and bruised, and placed in a vat, which is called a steeper, when they are covered with water. Here the substance is left for several weeks or even months. It is then squeezed through sieves placed above the steeper, that the water containing the coloring matter in suspension may return to the vat. The residuum is preserved under the leaves of the banana or palm, till it becomes hot by fermentation, when it is again subjected to the same operation, and this treatment is continued till no more color remains. The precipitate is boiled in copper to a consistent paste ; it is then suffered to cool, and is dried in the shade. The annatto of commerce, as is well known, is often largely adulterated, during the boiling process, with red ochre, powdered bricks, calcothar, farinaceous substances, chalk, sulphate of lime, turmeric, &c., while salt and oil are added as preservatives against a bug which is generated in annatto, especially that which is adulterated with farinaceous substances.

Instead of this long process, which engenders disease by the putrefaction induced, and which affords an inferior product, M. Le Blond proposed simply to work the seeds until they are entirely deprived of their color, which lies wholly on the surface ; to precipitate the same by means of an acid, and to boil in the ordinary manner, or to drain in bags as is practised with indigo. This process, it is said, has never been successfully carried out on a large scale until now (1870), as no precipitate could be found that did not in one way or another injure the color. Small quantities were prepared according to Le Blond's

theory, and the French dyers found it to be worth four times more than the ordinary annatto of commerce, that it was more easily employed, that it required less solvent, that it gave less trouble in the coppers, and that it furnished a purer color.

The American preparation of G. De Cordova, under the name of annattoine or dry extract of annatto, is claimed to be an improvement on, and a perfection of, the Le Blond and Vauquelin theories. The latter asserts that boiling injures the color, and as this has been clearly proven, Cordova reduces the precipitation to a powder, instead of boiling it to a paste. As this preparation gives a beautiful color, and is very much cheaper than any preparation of annatto in the market, at the same time being free from any deleterious adulteration, the managers of American factories are greatly pleased with it, and it is rapidly taking the place of other preparations.

It is cut or made ready for use in the following manner: 1st. put two pounds of annattoine in four gallons of clear cold water, and let it stand in this state one day, stirring thoroughly meantime, so as to perfectly dissolve the annattoine. 2nd. Then put two pounds strongest potash and one pound sal-soda (carbonate of soda) in three gallons of cold water. When this is perfectly dissolved and settled, pour off the clear liquor, and mix the two preparations (Nos. 1 and 2) together. 3d. Let this compound stand two or three days, until the annattoine is cut or dissolved perfectly by the potash, stirring occasionally meantime. Use about a tea-cup full for a thousand pounds of milk. Do not mix with the rennet, but put it in a little milk, and then mix in the mass of milk in the vats by stirring it in thoroughly, just before the rennet is used.

If a day or two after the preparation is made, the annattoine does not seem to be perfectly cut, so that specks can be seen, it is certain that the potash was not strong enough. Adding more of a stronger solution of potash will remedy the trouble.

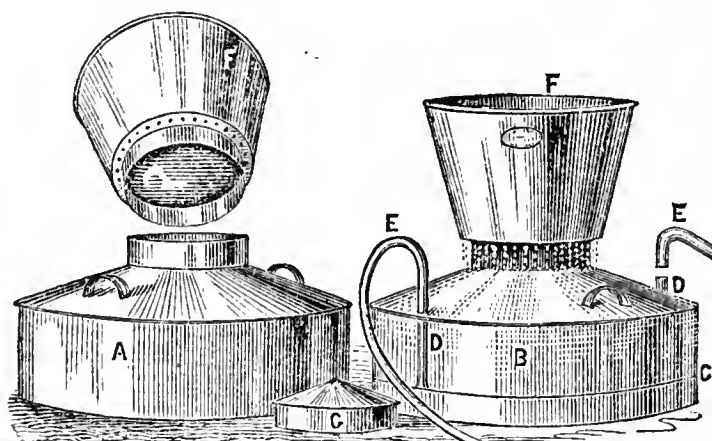
When annattoine is used for coloring butter, a portion of the prepared liquor is added to the cream, at the commencement of churning. It gives a very rich color, and may be used in winter-made butter with advantage.

MILK COOLERS.

In order that milk may be properly preserved in its transit from the farm to the factory, milk coolers have been introduced among the farmers to cool the milk at the farm as fast

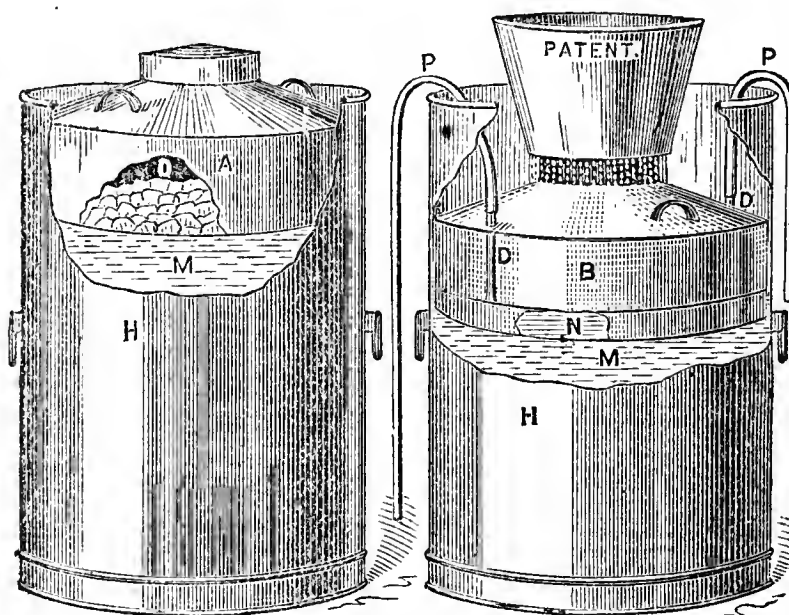
Fig. 30.

NATIONAL MILK COOLERS.



PATENTED NOV. 2, 1869, AND OCT. 18, 1870,
By A. P. BUSSEY, Westernville, Oneida Co., N. Y.

as it is drawn from the cow. There is a great variety of these implements. We give figures of the National Milk Coolers, and the Monitor and Iron Clad Cans used for hauling milk to the factory. Cold water or ice may be used for the purpose indicated.

Fig. 31.

A. Cooler, for water (N) and ice (O). B. Cooler, arranged for introducing water by means of syphons E, E, fixing on tubes D, D. C. Cover. F. Strainer. G. Body of cooler. H, H. Carrying-cans with coolers floating on the milk (M).

SWINE.

The keeping of swine to consume the whey or refuse slops resulting from butter and cheese manufacture is considered a

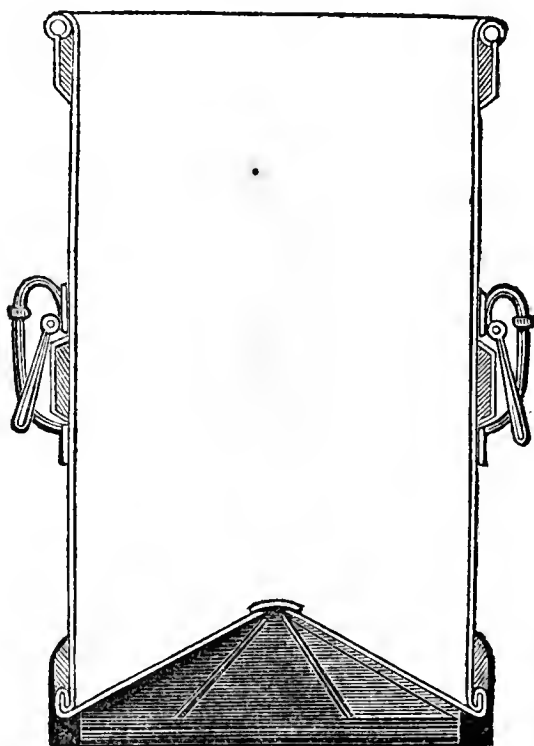
necessary part of the dairy business. The hogs are either kept at the factory or upon the farm. When kept at the factory, grounds are selected near the buildings, but so situated that offensive odors are out of the reach of the milk room and curing department; and upon these grounds pens are erected and the whey-reservoir is placed. Usually the grounds are large enough to give the hogs sufficient space for a range in the open yard. The pens are arranged so that each patron of the factory can have a place for his swine separated from the rest. The patrons therefore may keep their hogs in separate pens or allow them to run in common.

Monitor Carrying Cans, for Milk.

Fig. 32.



Fig. 33.



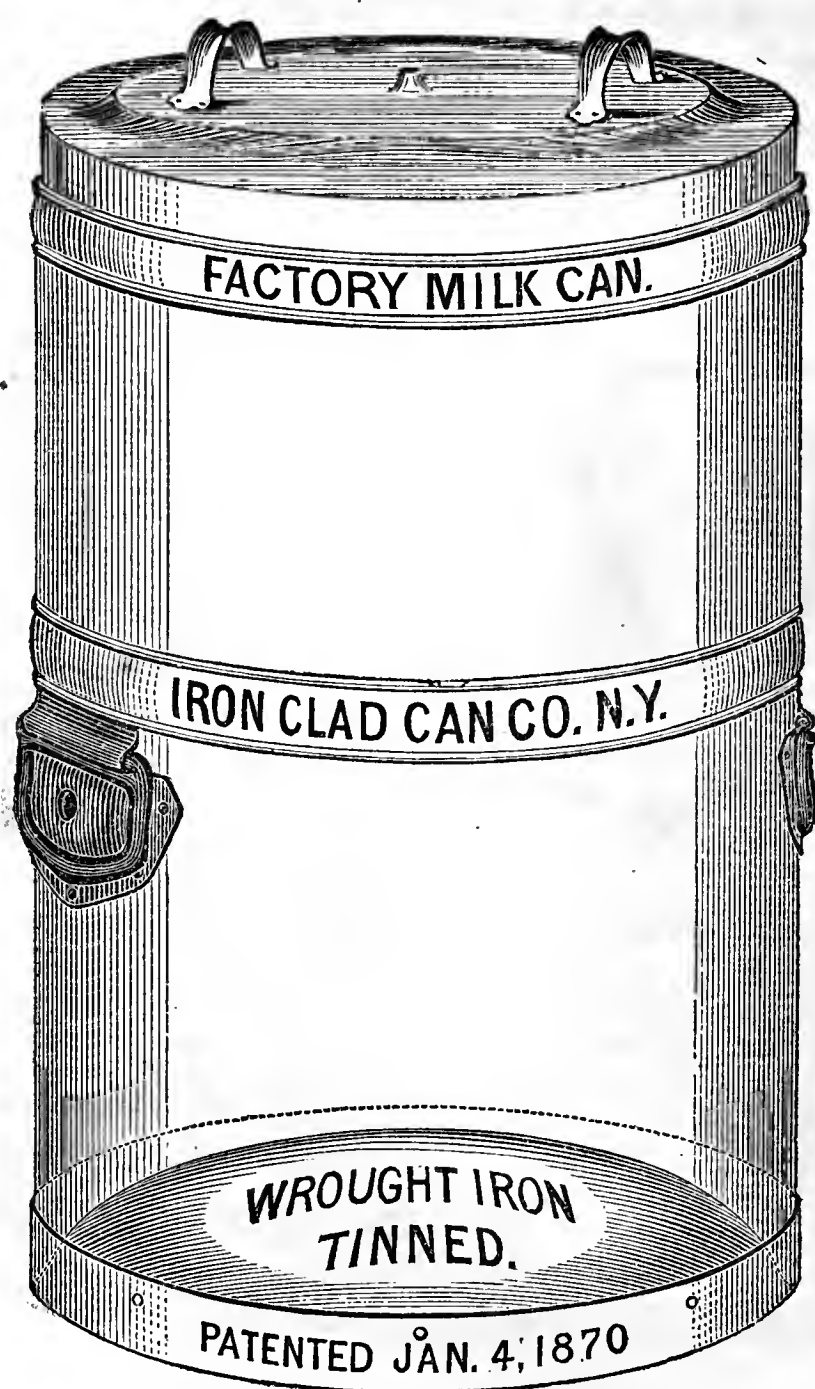
Pipes are arranged so as to conduct the whey from the reservoir to the troughs simply by opening the whey gates or a faucet. By this arrangement the feeding troughs are so supplied that each animal gets its daily rations of whey.

Each patron is allowed the keeping of one hog for every four or five cows from which he delivers milk. The proportion of hogs varies of course with the supply of whey. Patrons

who do not care to keep swine at the factory have the privilege of carting a certain amount of whey from the factory to the farm, and feeding as desired.

The difficulty of keeping the factory premises free from bad odors has induced many factory men to break up the pens and banish swine entirely from the establishment. In such cases

Fig. 34.—Iron-Clad Carrying Can.



the whey is run into a reservoir a considerable distance from the buildings, and patrons, after delivering milk, fill the carrying-cans with whey, and cart back to the farm.

In feeding whey to swine, bran, ship-stuffs, or some kind of meal, should be mingled with the whey. When this is done a

good quality of pork is made, and considerable profits are often realized from the whey. We do not approve of feeding hogs entirely upon whey: it does not contain the elements of nutrition in the right proportion to preserve the animal in good health and make the best quality of pork.

Hogs, it is true, will live on whey and take on fat, but the pork is soft, watery, and of inferior quality. It is doubtful whether such pork is a healthy article of food, as swine fed exclusively on such watery slop soon show symptoms of disease. Still, many dairymen keep a portion of their hogs on whey alone, and sell in early fall to the butcher or packer.

Millar's Patent Milk-can Handle and Sink Caster.

Fig. 35.

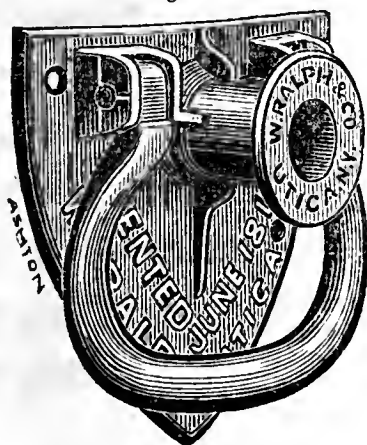
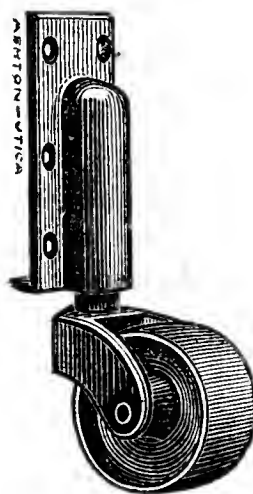


Fig. 36.



Absorbents, such as muck, sawdust, dry earth, etc., should be used freely about hog-pens to take up the liquid manures, and free the premises from disagreeable odors; and this course is especially desirable when hogs are kept in connection with butter factories, or in the vicinity of the farm-dairy. In addition to the benefits resulting from absorption and in keeping the air free from bad odors, another important advantage is gained in the increased quantity of manure.

PHILADELPHIA BUTTER.

In this connection, it may not be out of place to give a brief account of the manner of making Philadelphia butter, which has long held a very high reputation in America, and which often sells in Philadelphia at a dollar per pound. It is no bet-

ter in flavor and texture than fancy brands made at the butter factories of New York; but it is equally as good, and being put up in small rolls, or prints, and packed in refrigerators, it arrives in market as perfect as when it left the hands of the butter-maker.

The best Philadelphia butter comes mainly from Chester, Lancaster and Delaware counties, Pennsylvania.

The spring-house is about 18 feet by 24 feet, built of stone, with its foundation set deeply in the hill-side, the floor being about four feet below the level of the ground at the down hill-side. The floor is of oak, laid on sand or gravel; this is flowed with spring-water to the depth of three inches, and at this height the flowing water passes out into a tank at the lower side of the spring-house. The milk, when drawn from the cow, is strained in deep pans, which are set in the water upon the oaken floor. Raised platforms or walks are provided in the room for convenience in handling the milk. The walls of the spring-house are about ten feet high, and at the top on each side are windows covered with wire-cloth for ventilation. The depth of the milk in the pans is about three inches, and the flowing water which surrounds the pans maintains a temperature of about 58 deg. Fahrenheit.

The milk is skimmed after standing 24 hours, and the cream is put into deep vessels having a capacity of about 12 gallons. It is kept at a temperature of 58 deg. to 59 deg. until it acquires a slightly acid taste, when it goes to the churn. The churn is a barrel revolving on a journal in each head, and driven by horse-power. The churning occupies about an hour, and after the buttermilk is drawn off cold water is added and a few turns given to the churn, and the water then drawn off. This is repeated until the water as it is drawn off is nearly free from milkiness. The butter is worked with butter-workers, a dampened cloth meanwhile being pressed upon it to absorb the moisture and free it of traces of buttermilk. The cloth is frequently dipped in cold spring water and wrung dry during the process of "wiping the butter." It is next salted

at the rate of an ounce of salt to three pounds of butter, thoroughly and evenly incorporated by means of the butter-worker. It is then removed to a table, where it is weighed out and put up into pound prints. After this, it goes into large tin trays, and is set in the water to harden, remaining until next morning, when it is wrapped in damp cloths and placed upon shelves, one above another, in the tin-lined cedar tubs, with ice in the compartments at the ends, and then goes immediately to market. Matting is drawn over the tub, and it is surrounded again by oil-cloth so as to keep out the hot air and dust, and the butter arrives in market in prime condition, commanding from seventy-five cents to one dollar per pound.

Mr. Isaac A. Calvert, who markets his butter at these high prices at Philadelphia the year round, gives the following particulars of his management in a communication to Mr. J. B. Lyman, of the New York *Tribune*. He attributes his success to three points: 1st, the food of his cows; 2d, temperature; 3d, neatness and dainty refinement at every step from the moment the milk flows from the udder till the dollar in currency is paid for the pound of butter. He says, "I have found that I make my best butter when I feed on white clover and early-mown meadow hay. I cut fine, moisten, and mix in both corn-meal and wheaten shorts. Next to meal, I regard shorts, and prefer to mix them together. I feed often, and not much at a time. I do not use roots, unless it be carrots. My pastures and meadows are quite free from weeds. I cannot make this grade of butter from foul pastures, or a low grade of hay.

"*Temperature.*—This I regard as a matter of prime importance in making butter that commands a high price. Summer and winter I do not want my milk-room to vary much from 58 deg. In summer I secure the requisite coolness by spring-water of the temperature of 55 deg. Fahrenheit flowing over stone or gravel floor in the milk-house. This can be accomplished without water in a shaded cellar ten feet deep. As good butter can be made without water as with, but the milk and cream must be kept at all times a little below 60 deg.

"We skim very clean, stir the cream-pot whenever a skimming is poured in, and churn but once a week summer and winter. Just before the butter gathers we throw into the churn a bucket of ice-cold water. This hardens the butter in small particles and makes a finer grain. In the hot months this practice is unvarying.

"In working we get out all the buttermilk, but do not apply the hand. A better way is to absorb the drops with a linen cloth wrung from cold water. The first working takes out all the milk; at the second we handle delicately, with fingers as cool as may be. The salt is less than an ounce to a pound, but not generally much less. The balls each weigh one pound, and receive a uniform stamp. On packing for market, each ball is wrapped in a linen cloth, with the name and stall of the marketman written upon it. Our tubs are made of cedar-plank, 1 1-2 to 2 inches thick, and lined with tin. On the inner face are little projections on which the shelves rest. The balls are not bruised or pressed at all, and pass into the hands of the consumer as firm, as perfect in outline, and as spotless as when they left the spring-house.

"We find *uniformity* to be a prime virtue in the butter-maker. We produce the same article whether the cows stand knee-deep in white clover-blooms, or sun themselves on the lee-side of the barn in February.

"There is a small ice-chamber at the end of the oblong tub which we use in summer, so that in dog-days the heat within the tub does not get higher than 60 deg. Fahrenheit. I need not add that we observe a scrupulous, a religious neatness in every act, and in every utensil of the dairy. Milk which upon leaving the udder passes through an atmosphere loaded with stable fumes, will never make butter for which we can get a dollar per pound. No milk sours upon the floor of the milk-room; none is permitted to decompose in the crevices of the milk-pans; the churn is scoured and scalded till no smell can be detected but the smell of white cedar.

"Our customers take the napkins with the prints, wash,

iron, and return them when they come to the stand the butter-days. These are generally Wednesdays and Saturdays. With these prices we have no difficulty in making a cow pay for herself twice a year; if she cost 60 dollars, we sell 120 dollars' worth of butter from her in twelve months."

It may be remarked that the sour milk is employed by the Philadelphia butter-makers as a feed for swine. It is estimated that such milk will make 100 lbs. of pork per cow.

The cows in the district where the Philadelphia butter is made are well sprinkled with the Jersey or Alderney blood, and about a pound per day from each cow is considered a fair average for the best dairies.

CROZIER'S MILK CELLAR.

A committee consisting of Mr. J. B. Lyman and Frank D. Curtis, from the American Institute Farmers' Club, recently visited the farm of Mr. William Crozier. The following report regarding a milk cellar seen on this farm, was presented by Mr. Lyman to the club. The walls are 36 x 18 feet, and it is divided into ice house, milk room and butter kitchen as in this plan. Two tubes or conductors go down from the upper part of the ice house. They are made of boards eight inches wide and an inch thick, with holes bored in them. The holes allow the cold air to enter from the ice, and it pours in a stream from the mouth of the tube into the milk room. The temperature of the air as it comes out at the mouth of the tubes is about 35 degrees. As the milk room has thick walls and the windows are high, this flood of air at 35 degrees is able to lower the mercury to 62 degrees, and even lower, in July. Sometimes he closes one tube to keep the room from growing too cold. The draft is the strongest in the hottest weather. In spring and fall there is little current, and in winter, when the fire in the stove is constantly burning, the draft would be the other way. But then the mouths of the ice tubes are closed. By this arrangement the desired temperature is secured the season through, and there is no difference between the June

butter and his January butter. He makes "June butter" the year round.

The stone work was much of it done by farm hands. The hemlock cost \$20 per thousand, and the pine \$30 to \$35. The whole building cost him \$650. He gets ten cents a pound over the highest market price. Making, say 200 pounds a week, his gain is \$20 a week by having the best arrangement for butter making.

Thus his milk house pays for itself every nine months, to say nothing of the greatly increased facilities for doing work afforded by a pump, churn and stove so convenient.

He consumes about a ton of anthracite in the four coldest months, and a slight allowance is to be made for wood used in summer to heat water for washing and scalding. Your committee could see nothing wrong, and much that was exactly right about this house and this system, and wherever ice forms to the thickness of three inches and over, it may confidently be recommended to every butter maker who milks a dozen cows.

BUTTER AFFECTED WITH CASEINE.

From a little manual published by the Messrs. Blanchards of Concord, N. H., and which they furnish to go with their churn, we find the following very sensible remarks:

"The proportion of caseine remaining in butter, as ordinarily manufactured, is quite variable, depending upon the manner in which the cream is separated from the other portions of the milk. By the old method of setting milk in shallow pans and permitting currents of dry air to sweep across the surface of the milk, much caseine became dried to the cream so firmly as to be inseparable during all the after processes, finally becoming a portion of the butter. By the latter and more improved processes, with sufficient painstaking in the after manipulations, the proportion of caseine may be reduced to a mere trace. Upon this, and the proportion of the oleine and the neutral or flavoring fats, the quality of the butter depends, and to the accomplishment of these two specific ends, he who would succeed must direct his efforts.

"The increase of the fatty matter is dependent upon the feeding and care of the animal, and to that branch of our subject such allusion has been made as our space will permit.

“Setting and Cooling the Milk.—From time immemorial the practice of setting the milk in very shallow pans has prevailed, and the opinion was formerly believed established, that only through a shallow mass of milk could the cream rise to the surface. This practice had its origin in the necessity for cooling the milk soon after it is drawn from the cow, to prevent its souring before the cream could rise, and not, as has been very erroneously inferred, from any difficulty about the rising of the cream. Hundreds or even thousands of experiments have been conducted with the view to permanently settle this question, and we have yet to learn of the first one which has not resulted in sustaining the principle that with proper apparatus for cooling, it is of no possible consequence how deep the milk is set for the purpose of raising the cream.

“The cooling of the milk is of the first importance. It contains within itself the elements of decay, and when left to itself fermentation and putrefaction speedily ensue. But by reducing the temperature to about 58° or 60°, the process is retarded, not prevented, and time is afforded the cream to rise before the other parts of the milk become so changed in their structure as to entangle and hold the oily portion of the cream. But precisely the same effect may be produced by the application of heat, and we not unfrequently hear it recommended. In this case, however, the very important circumstance, that the oils which flavor the butter become volatilized and escape, is quite overlooked.

“It is believed, then, to be practically settled, that the best results are attained by reducing the temperature of the milk as soon as practicable, after it is drawn, to about 58° F. The milk should be placed in the vessels where it is to remain before the cooling is commenced, that the rising of the cream may not be retarded by subsequent agitation. The only really practicable method of cooling the milk, without agitating it, is to place it in comparatively narrow vessels, and surround them with cold water, as high or higher than the surface of the milk within. It is idle to attempt to cool milk or any other fluid by the application of any cooling substance to the bottom. If the vessel itself be of a material which is a good conductor, it is a little help, but the process is at best slow and unsatisfactory.

“We make the rule that milk should be set in vessels placed in water, and the temperature reduced as soon as may be, to about 58° F., but that the temperature of the room should be about 65° or 70° F.

“The form of the vessels is not material, if only they be so narrow that the cooling is effected in season to prevent the souring of the milk before the cream has risen.

“The most economical arrangement of which we have any knowledge, consists of a long, narrow tank, with a jacket of tin for the cold water. The most approved form is 8 inches broad, 11 inches deep, and 6 feet long, which is made from a single large sheet of tin, without seam or solder, except where the end and jacket are attached. If more than one is required to hold the milk at each milking, they should be placed side by side in the

same frame or sink. In this case it is more economical to dispense with the jacket and use a wooden vat for the water.

“ There is, in this form of vessel, a very large saving in the cream which adheres to the sides of the smaller style of vessels ; but the economy of labor in the cleansing and care of the vessels is really the greatest of all.

“ Whatever the form of the milk vessels, running water is the best and most economical agent to be employed in cooling the milk. Well water answers a very good purpose, but the labor of raising it is sometimes a bar to its successful use.

“ Ice should never be used in butter-making in any of its departments, except to reduce the temperature of water, and then it is well to *beware* of ice cold water. The immediate contact of ice with milk, cream or butter, does in some manner not well understood, exert a disorganizing effect, and the product is permanently injured thereby.

“ *When and how to Skim.*—Milk cooled and set as has been recommended, will keep sweet as long as is necessary for the cream to rise, however warm the room ; and the time for removing the cream may be subordinated to the convenience of the dairyman. The more convenient and profitable time will generally be found to be from 24 to 30 hours after setting. It should not, in any case, be deferred until the milk begins to turn sour.

“ The old form of skimmer, required to separate a film of cream almost as tough as a leather apron from a body of hard loppered milk, is not adapted to the removal of the cream that rises on milk cooled as above described. The cream, under these genial influences, having been constantly parting with its caseine instead of becoming encased in it, is in a condition of fluidity and must be removed by dipping instead of skimming. The most approved implement for this purpose is made of tin in the form of a cone, and holds about a pint. The small end should be made pointed. The edges of the large end should be left sharp, and not be rolled or wired. An upright, straight handle should be attached to the large end of the cone. When used it should be pushed perpendicularly down through the cream into the milk, until the cream runs in on all sides at the same time. If some of the milk is taken with the cream, no injurious result will follow ; indeed many good butter-makers prefer taking enough, so that the cream may not become too stiff during the operation of churning.

“ Cream may be kept several days, if necessary, but it is better, as a rule, to churn every second or third day. The practice which has acquired among many, of keeping cream several days ; and drugging it from time to time with saltpetre or something else, can not be commended.

“ When milk sours, it is because of the formation of lactic acid from the milk sugar. This chemical change is the result of the growth of a microscopic vegetable organism, which, according to Hallier's late investigations, is of the same origin as common yeast. Like common yeast, this plant requires oxygen for its development. This it gathers from the air if the latter have access ;

but in the comparative absence of air, as when growing in milk, it decomposes the sugar, and a lactic acid is the chief result of this metamorphosis. If milk, which by short exposure to the air has had the microscopic germs of the ferment-plant sown in it, be then excluded from the air as much as possible, the plant, in its growth, is necessitated to decompose the milk sugar, and hence the milk rapidly sours. On the other hand, exposure to the air supplies the ferment-plant with free oxygen, and the milk remains sweet for a longer period. Such is the theory of the change. That low temperature should prevent souring, is in analogy with all we know of chemical changes.

“Stirring the cream does not promote souring, but rather hinders it by increasing access of air; it may be advantageous in making the souring uniform.

Fig. 37. Millan & Son's Milk Pails.

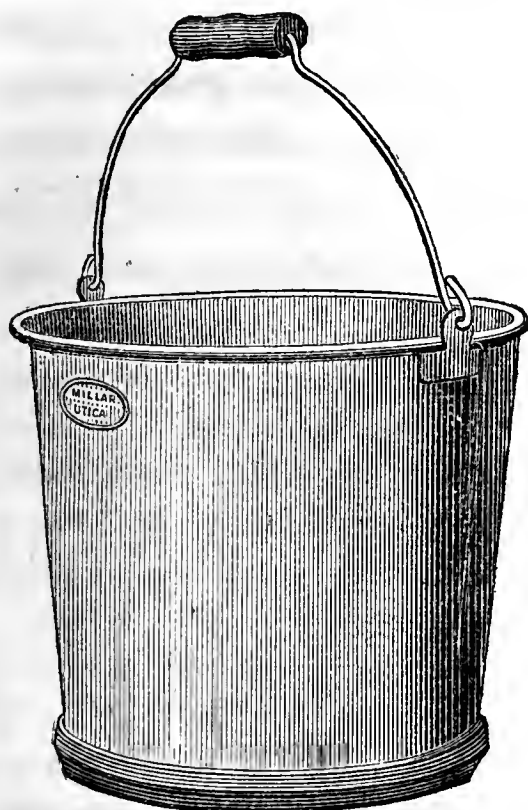
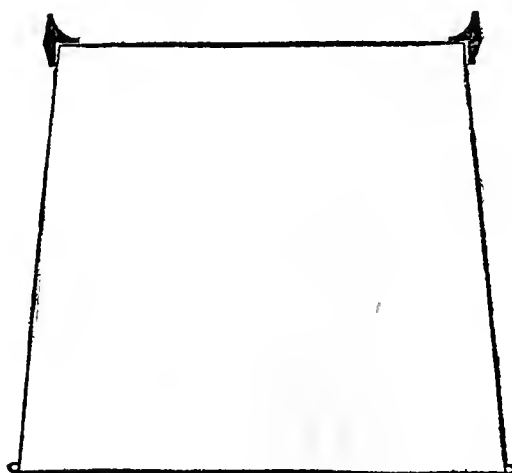


Fig. 38.



“*When to Churn.*—Although the milk should never be permitted to sour before skimming, the cream, on the other hand, should become slightly acid before churning. To accomplish this end most expeditiously, the temperature may be raised slightly; keeping it in the warm milk room will usually suffice; but previous to putting it in the churn it should be again cooled, according to the quality of the cream. If it be rich summer cream, 55° is most favorable; if it be the product of short, poor feed, or of straw, or of roots, or if the cows have been exposed to cold storms, and under the necessity of exhausting the oleine of the butter, the temperature must be raised to correspond; and it may even require so much heating that little of the butter flavor will remain. For all ordinary cases the range may be set down as from 55° to 65°.”

MILK PAIS.

The importance of using milk pails that will not absorb

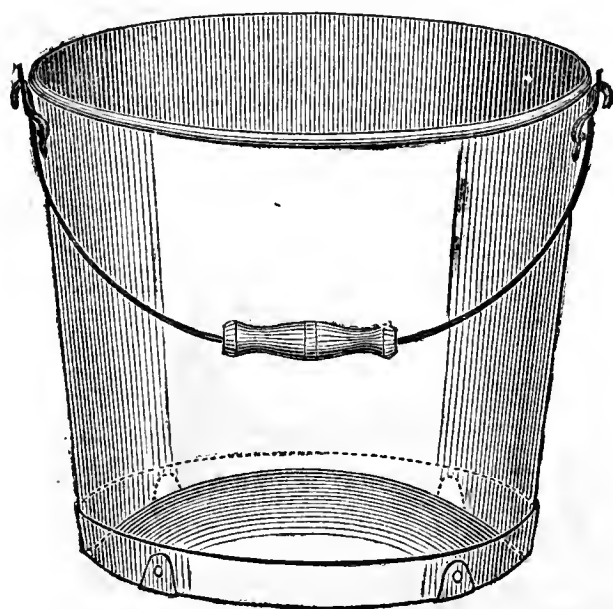
paints and which can be easily cleaned, can not be over-estimated.

Wooden pails should never be used for milk, because of the difficulty of keeping them in order.

Chas. Millan & Son, of Utica, N. Y., have recently brought out a superior tin milk pail, a cut of which we give in the figures on the preceding page.

They are made in the best possible manner, from four-cross tin, imported on purpose for them, have but one seam in the body of the pail, and are soldered very smoothly. A tinned malleable iron rim or band is soldered firmly to the bottom enclosing it, and is so constructed as to thoroughly protect and support it and to raise it sufficiently to prevent it from resting on the floor and from picking up the dirt; it is also convenient for tipping the pail. The wire in the upper edge of the pail is enclosed by the tin and then soldered so that it cannot rust.

Fig. 39.—Iron Clad Pail.



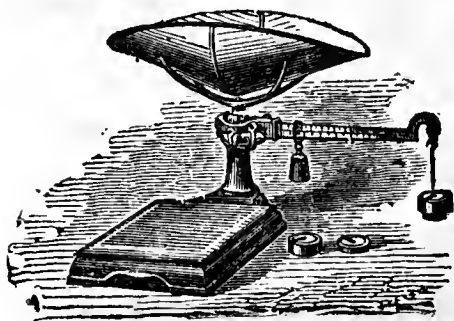
The pail is made from the best tinned wire.

The Iron Clad Co. of New York city makes a very substantial pail with convex bottom, upon which are rests to keep it out of the dirt, which ensures cleanliness in this part. The accompanying cut shows the form of this pail.

SCALES.

Another important requisite for the dairy is a convenient and accurate pair of scales.

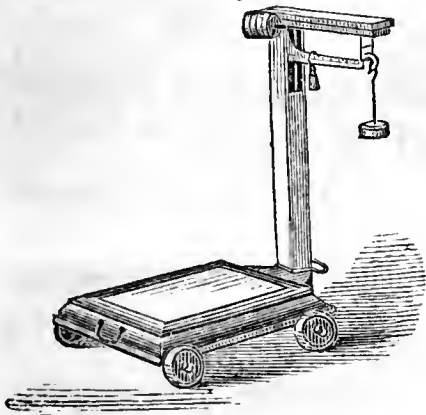
Fig 40.—Family Scales.



Edward F. Jones, of Binghamton, N. Y., manufactures a very desirable article in this line. The Universal or Family Scale, of which we give a cut, has both platform and

scoop, and combines all the advantages of a portable and counter scale. Its capacity is from 1-2 ounce to 240 pounds,

Fig. 41. —Platform Scales.



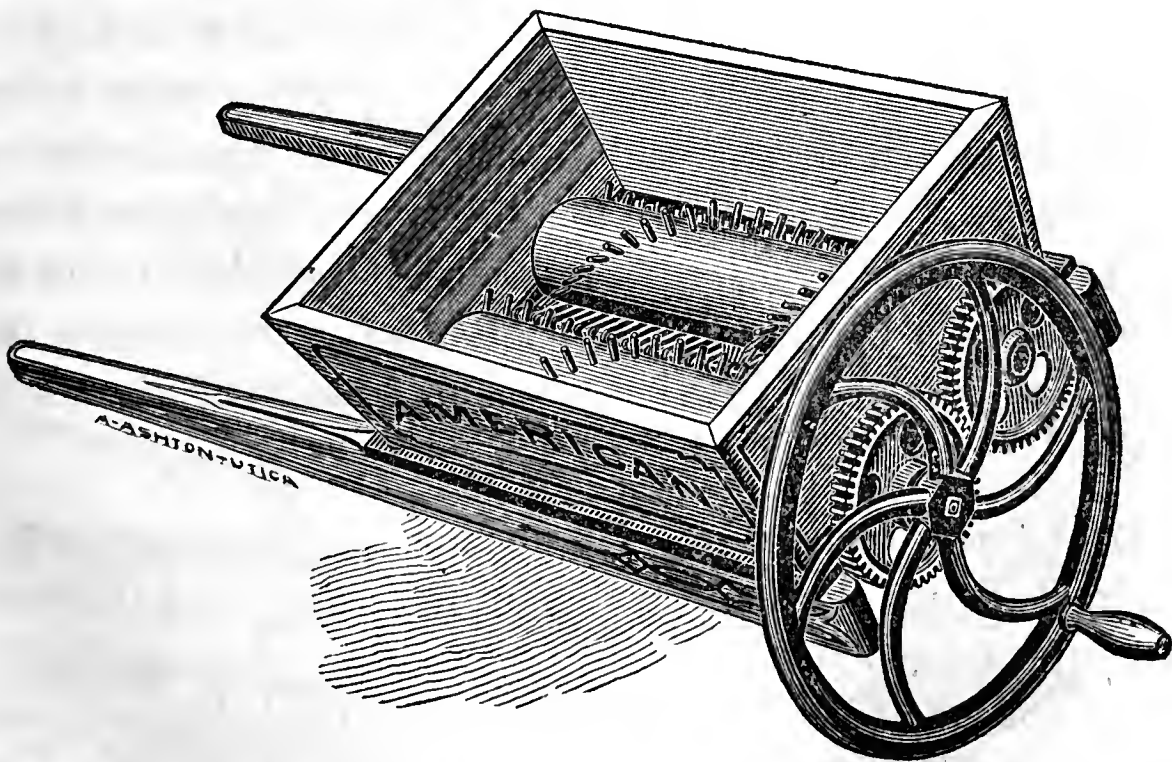
and is best adapted to the purposes of the butter dairy, or when any light article is to be weighed.

The 600 pound portable platform scale on wheels is the size usually used in cheese factories. The accompanying figure represents it.

In cheese manufacture, especially where the milk is liable to become changed or is not delivered in good order, the curd mill is of great service.

Butter factories should always be provided with this machine if skim cheese is made in connection with butter. One of the best curd mills made is the *American*, manufactured by Wm. Ralph & Co., of Utica. It has a double cylinder, and being provided with a heavy balance wheel is worked with greater ease and more efficiency than some mills. We give an illustration of the mill in the following cut:

Fig. 42.—The American Curd Mill.



THE BUTTER DAIRIES OF CALIFORNIA.

In 1870 I crossed the continent and made an examination of some of the butter making districts on the Pacific. My ob-

servations were given in a series of articles in MOORE'S RURAL NEW YORKER, from which I select and quote the following:

The Coast Range of California, etc.—California is estimated to contain within its boundaries 189,000 square miles. About 50,000 square miles are supposed to cover the entire range of coast-valleys and mountains.

There are large tracts of country on the coast range adapted to grazing and the dairy, though, taking the whole state together, I was told the dairy lands were of comparatively limited extent. One great advantage which the coast lands possess is a low, even temperature—a temperature averaging about 60 deg. Fahrenheit during summer and winter, and subject to no extremes of heat and cold, like that prevailing in the middle and north Atlantic states. The winters are so mild that cattle do not require to be housed, and during most of the time can procure sufficient sustenance in the field. Indeed, cattle are often wintered without a particle of food other than that which they pick for themselves over the ranches—though it is not generally considered good economy to allow the herds to thus shift for themselves during the first part of the rainy season, since the rain washes out the nutritive elements of the old grasses, while the new vegetation springing up, is flashy, or too immature to afford the requisite nourishment for the thrift and well-being of the animal. Hence in November and December it is considered good economy to eke out the pastures by giving the herds a daily allowance of fodder.

The Climate, Grasses, etc.—To understand fully how stock is fed in California some explanation of the seasons and the character of herbage found upon the ranches will be required. If we except the higher mountainous ranges, the California year may be divided into two seasons only—the wet and dry. The rains begin to fall during the latter part of October and continue during November and December. The moisture is sufficient to start vegetation into a vigorous growth. Green past-

urage is abundant in January, February, March, April, and up to about the first of June and July. Then comes the dry season, during which no rain falls until the latter part of October or first of November, and sometimes it holds off until December.

Most of the native grasses are annuals. The wild oat grass and bunch grass are regarded of most value. The Gramma, or bunch grass is exceedingly nutritious. Stock thrive upon it at all seasons, except, perhaps, at the beginning of the rainy season, when, for a few weeks, its nutritiousness is impaired from the causes which have been previously explained.

In July and August, it as well as all others, becomes dry and brown, and the fields present hardly a vestage of green. Indeed, the fields are so devoid of any green or growing plant, and the tufts of grass are so brown and dried up that the eastern stock-grower can scarcely rid himself of the impression that the whole country is of little, if any, value for grazing, and would supply only a meager sustenance for a few goats; and yet immense herds are seen cropping this withered, dead, or perfectly dry, crisp herbage, and the animals look sleek and fat, and fit for the shambles. Nothing astonished me more than this seemingly incongruous state of things; for to an eastern farmer, fat cattle at pasture are always associated with luxurious vegetation and an abundance of succulent food. It is true, along the borders of streams, in the narrow valleys or deep gorges, a fringe of green breaks the monotony of the dead and apparently worthless vegetation, covering the hills, and stretching away to the distance on the plains; but these are scarcely sufficient to account for the uniformly fine condition of stock.

It becomes evident, therefore, that from the peculiarity of the climate, and perhaps from the nature of the plants themselves, their nutritive elements are retained; and that the standing grass in the field is cured as perfectly for food in a natural way as farmers at the east do it by artificial means. And this is more readily explained from the entire absence of

rains, the dryness of the atmosphere, and the uniform temperature of the climate. Evidently, in case of the bunch grass, which grows in dense tufts, the dry weather coming on arrests the further growth of a mass of foliage, thoroughly curing it upon the root before its nutritive elements have been lost or changed into woody fibre, while a large proportion of those stalks bearing seed have also been checked in growth and dried in time to retain a large proportion of nutrition.

In comparing California, as a dairy region, with grazing lands on the Atlantic slope, the winter and spring months correspond with our best grazing season. From the first of January to June, the grasses grow in great luxuriance. July, August and September, correspond with our fall and early winter, while November and December, when stock require a little feed, may be set against our six months of cold and snowy weather. It is evident, so far as climate is concerned—so far as the storing of cattle-food and the necessary breadth of land for growing such food, the advantages are all in favor of the Pacific. But on the other hand, our nearness to the markets of the world, the permanency of our grasses, our established system and skill in manufacture, must, in a measure, compensate for the rigors of the climate, and other disadvantages which do not obtain in more favored sections.

Comparative Profit from Grazing Lands.—From what I saw of California, and California farming, I became strongly impressed with the idea that the grazing lands of the state, for stock-growing and the dairy, can be made to pay quite as largely as lands devoted to almost any other special agricultural interest. Fruit trees of all kinds grow with great rapidity, and produce enormously. But, at present, the markets are limited, and the supply so much beyond consumption that there is no profit in fruit-growing.

I saw peach trees producing choice varieties of fruit, (only across the bay from San Francisco, and where daily transport of fruit could be made for a mere trifle), that were paying nothing to the owner beyond affording food for swine, the fall-

ing fruit being carted out for that purpose. The product of large apple orchards is often left to rot on the ground, or a portion only of the fruit converted into cider for vinegar.

The vineyards, can, perhaps, be made to pay well for wine, since the climate and soil are so wonderfully adapted to grape culture that grapes can be grown at a mere trifling expense.

The Largest Butter Dairy Estate in the World.—But I set out to speak of some of the dairy lands visited, and perhaps a brief description of the Howard & Shafter Rancho will be of interest. This is probably the largest butter dairy estate in the world. It is at least the largest that has come under my own immediate observation, whether in this country or in Europe.

Some general idea of its extent may be gathered from the fact that it has a coast range of fifty miles, and contains seventy-five thousand acres. About one hundred miles of fence have been erected on this estate at a cost of \$400 per mile. It is located in Marin county, at Point Reyes.

Marin county lies directly north of San Francisco and the Golden Gate. At the northwest point of the county Tomalis Bay, a long, narrow body of water extends southward, and is nearly met by Sir Francis Drake's Bay pushing northward. This makes a neck of land, which has the appearance on the map of projecting into the ocean. Now, by extending a line in a southeasterly direction from Tomalis Bay toward San Francisco, so as to give us a strip of country on the east coast of Sir Francis Drake's Bay, we have on the west of this line and bounded by the two bays and the ocean the famous Point Reyes Rancho.

The character of the country over the Point Reyes estate may be described as a succession of hills and valleys. In some places there are large, level tracts. Good roads have been made over the lands, and as the carriage winds over the hills and through the canyons the scenery is most picturesque and charming. The climate here is delightfully cool and refreshing. Fanned by the breezes of the Pacific, the temperature

scarcely ever rises above 65° or sinks below 50° , while the average through the year is not far from 60° .

Bunch grass, wild oats, and other natural grasses, grow in great luxuriance, and are depended upon as pasture for stock.

About three thousand cows are in milk on the estate, and they are divided up into twenty-one dairies, averaging about one hundred and fifty cows to each. The different farms or ranches are substantially fenced with red wood pickets six feet long, driven into the ground about six or eight inches apart, with a rail placed horizontally about two feet from the top to which each picket is nailed. As there is no frost here, these fences keep their position, and will stand without needing repair for twenty years. Generally, each ranche has interior fences dividing the land into four fields.

Mr. Howard states that he commenced improving his stock about the year 1858 by crossing common eastern cows with two thoroughbred Short-Horn bulls of good milking family brought from Vermont at a cost of \$10,000.

One of the Vermont bulls was an exceedingly fine one, and his stock proved to be excellent milkers.

A year or two after, twenty-two head of Devon cattle were purchased and introduced among the herds. This breed did not prove satisfactory, and it was discarded, and in 1865 he commenced again with the Short-Horns, raising annually one-fifth of the calves from the best cows. In this way the stock has been improved so that a good flow of milk is obtained.

Size of Stock Influenced by the Surface of the Country.—I have stated that the Point Reyes estate was broken up into numerous hills and valleys. Many of the hills almost approach the dignity of mountains. Their sides are rounded, and do not generally present an abrupt surface, but are of a sufficient inclination to be readily reached in all their parts by cattle. This uneven surface, requiring the climbing of hills and descent into valleys in quest of food, has had a strongly-marked influence on the size and form of the stock. The animals are quite small for Short-Horns, and apparently more active than is

usual for that breed, showing, in a very marked degree, what a controlling influence the surface of a country has in moulding the form of animals. The stock I found universally in fine condition as to flesh, and in every respect it appeared to be in vigorous health; but the smallness in size was a point of interest to me, as showing how animals bred for several generations in a hilly country gradually adapt themselves to the surfaces over which they are compelled to travel in quest of food.

It seemed to me that the Ayrshires were the kind of cattle best adapted to this locality, and I strongly advised an infusion of this strain of blood among the herds of Point Reyes.

System of Rentals.—The management of so large an estate is not without difficulties. Recently Mr. Howard has introduced a system of rentals, which relieves the proprietors from a vast amount of care and vexation. With the exception of what is termed the "Home Rancho," all the places are rented at a fixed rate per cow. The general features of this rental are as follows: The landlord furnishes land, cows and buildings, making the rent at \$30 per cow. The tenant is required to raise one fifth of the calves, and build or keep in repair certain fences, the landlord furnishing the material. All implements of husbandry and dairy utensils are furnished by the tenant. The dairies, on an average, make about one hundred and eighty pounds of butter per cow, which is sent to San Francisco, and commands from thirty-three to thirty-five cents per pound.

Quality of Butter.—The butter made at Point Reyes is good, and dealers in San Francisco informed me that it was the best that was brought into the market. The texture, when well made, is exceedingly fine, being more waxy in its consistency than much of the butter of New York. With the same skill as that exercised in the butter factories of Orange county, I should say that the very finest fancy product could be obtained. The low, even temperature of the climate favors the obtaining of milk in the best possible condition. The water is soft and

pure, and the feed is said to be sweet and free from plants that give a taint to milk.

The Dairies.—I visited quite a number of dairies, traveling, in all, nearly a hundred miles over the estate. The dwellings are neat and substantial, each place provided with dairy house, corrals for enclosing cattle, and sheds and barns for storing fodder. The cows are milked in the open yard, and the milkers empty the milk into a receptacle outside the building, from whence it is strained and flows into a receiving can in the milk room. From this it is drawn through a faucet into pans, which are immediately set upon the racks. Water, either conducted by pipes from springs, or pumped into reservoirs, is in the corrals, and supplies the dairy. The temperature of the milk rooms is scarcely ever above 65°, and artificial heat is more frequently required in the milk rooms than too high a temperature resulting from natural causes. I saw the process of butter making in all its stages, but perhaps a detailed description of the work at two or three ranches may be sufficient to give the reader some general idea as to the manner in which California dairies are managed.

On the Point Reyes estate several of the dairy establishments, or farm buildings, are located in the canyons or valleys; though where there are large, level tracts of land and conveniences of running water, advantage is taken of the situation to establish "headquarters" for the rancho. The tenants, or those managing the several ranches, are mostly from New England or New York.

In some cases unmarried men with Chinese house-servants carry on the establishment; but usually married men with their families are located here. At one point I found a school for the education of the children, taught by a genuine New England "school mistress," who received \$30 per month and board for services. During my trip I not unfrequently saw "little lassies" going and returning from school mounted on mustang ponies. Regular water communication is soon to be

established between Point Reyes and San Francisco, which, of course, will render the estate less isolated.

A few days before my arrival, a division of the estate had been made between the three partners, which gives each some 25,000 acres of land. In the division, that portion lying upon Sir Francis Drake's Bay falls to Mr. Howard. The point at the head of the bay is exceedingly lovely, the harbor is excellent, and the level stretch of land back from the shore seems to be admirably adapted to the location of a town or city. Indeed, the natural advantages for a town at this point are so great, that the time cannot be far distant when this spot will be utilized for that purpose.

Muddy Hollow.—The buildings here are substantial and conveniently arranged. The dairy house, or milk-room, stands on one side of the corral, and is twenty-four feet square. Racks are arranged along the sides of the room for setting the milk—the pans resting on slats in tiers, one above the other. The cows are milked in the corral or open yard, and as fast as each milker fills his pail, he carries it to a platform on one end of the milk-room, where it is emptied into a receiving conductor provided with a strainer, from whence it flows into a large tin can in the milk-room. In this way the floor of the milk-room is not soiled by the feet of the milkers, and slops and dirt are avoided in straining the milk. The milk is drawn from the can through a faucet, each pan getting about half a gallon of milk, or a quantity sufficient to set in the pan from two and a-half to three inches deep.

Management of Milk.—The climate here is so cool that the temperature of the milk-room does not rise above 65°, and in summer it is often so cool that a little fire is necessary in the room to keep the milk at the desired temperature for the cream to rise. The milk usually stands about forty-eight hours, and is allowed to get slightly acid before skimming. The pans are then removed to a bench in the center of the room, the cream loosened on the edges of the pan by running

a thin wooden blade around it, when the pan is canted up, and the cream flows off into a large tin cream can. The milk then goes into a slop reservoir on the bench, arranged with pipe at the bottom for conducting it off to vats away from the building, where it is to be used for the feeding of swine. The portion of conducting pipe in the milk room is arranged in a double curve, or V, so that in cleansing the water remaining in the curve prevents gases from passing through into the room from below.

Churns and Churning.—Churning is done every day by horse power, a common lever power located outside the building being employed here as well as at the other dairies. Mustangs are attached to the lever and put the machine in motion by travelling round and round in a circle. An oblong box churn is used. The ends are twenty-seven inches square and the length of the box is five feet. It hangs horizontally upon a frame supported by two iron gudgeons at the ends of the box, and upon which it revolves. On one side of the box there is a door, which opens to receive the cream, when it is closed and the churning accomplished by setting the power in motion and revolving the box. The temperature of the cream when it goes to the churn is about sixty-two degrees, and churning is usually perfected in from one-half to three-quarters of an hour. The butter, when it comes from the churn, is washed in soft water, worked and salted at the rate of one ounce of salt to the pound of butter, when it is set aside until next day and then worked a second time and packed for market. It is manipulated but very little at the second working, just enough to get it into shape.

Butter - Worker.—The butter-worker at these establishments struck me as a very handy appliance. It consists of a heavy oak slab, in a perfect circle, about three and a-half feet in diameter, set at an inclination, so as to allow the buttermilk to pass off, and revolving on rollers arranged in a standard which supports it in the center. At the lower end of the machine, just beyond the circular plank, there is an upright, at the top of

which is fastened a metal socket for the reception of the lever used in working the butter. This socket works on a universal joint, so as to be moved in any direction. A plank with groove near the outer edges, is arranged below the circular slab to catch the buttermilk and moisture flowing from the butter during the process of working, and it is also slightly inclined, so that all slops pass off along the grooves and are deposited in a tub. By this arrangement, it will be seen the circular slab or bed of the butter worker can be moved backward or forward on the plane of its circle, while the universal joint to which the lever is attached, allows the lever to be handled in any direction. These butter workers are the most convenient of the kind of any I have seen, and can be profitably introduced into some of our New York butter factories.

Molding and Packing.—The butter is put up and sent to market in two forms—in barrels, half barrels, and in two pound rolls placed in packages. The barrels are of oak, nicely made and strongly hooped. They hold about two hundred and twenty-eight pounds of butter. The butter is packed solid, the cask headed, and brine as strong as it can be made is poured in to fill up all the interstices. Butter going to market in this way brings from two to three cents less price per pound than that put up in rolls. The rolls are made three inches in diameter and nearly seven inches long. A mold is used for the purpose of forming the rolls, and it has two iron handles crossing each other on a pivot, and worked like a pair of nippers. The molds being opened a bit of butter is nipped up sufficient to fill the mold, and by pressing the two arms or handles together a powerful leverage is brought to bear upon the butter mold, compressing the butter into a solid roll. Then with a thin wooden knife, or paddle, the ragged points of butter which have been forced out on either end of the mold, are cut off even with the mold and smoothed down, and the instrument opened, when out drops a neat roll of butter, weighing just two pounds. The whole mass having been rapidly molded in this way, and the rolls dropped upon the

table, the next process is to wrap each roll in cloth. Fine thin bleached cambric, cut in strips of the desired length to go round each roll, and wide enough to leave about half an inch projection of cloth at each end of the roll, are moistened in strong brine and placed upon the table. Then one of the strips is spread out, the roll of butter laid on one edge and rapidly rolled forward, the cloth adhering smoothly to the package. The cloth on the ends is now pressed down in place, and you have a dainty little roll in neat white muslin wrappers, with a little golden circle at the ends to show its texture and quality. Then the rolls are set on end in an oblong box of cedar or red wood, the cover fastened down, and thus they go to market.

The wholesale price for butter, put up in rolls, has ranged from thirty-three to thirty-five cents per pound when it arrives at San Francisco.

The Stock.—In the Muddy Hollow dairy there were one hundred and sixty-six cows in milk. I found the cows in fine condition as to flesh, notwithstanding the feed upon the hills was brown, dry and crisp. Mr. HAGERTY, the manager, stated that in "flush of feed," when cows were doing their best, the average yield of butter per day was one and one-fourth pounds per cow. The cows have a large range, and it struck me as somewhat difficult to collect all the animals together in the corral, night and morning, since the numerous hills and valleys must be looked over to find loitering beasts; but I was assured that there was seldom any trouble from missing animals. At milking time two persons, mounted upon mustangs, are sent out to collect the herd together. Each driver has his beat or range to look over, and the mustangs scour the hills and valleys, starting the cows into line; and as the drivers are responsible for missing cows, and are discharged for neglect in bringing them to the corral, they become exceedingly expert and sharp in looking over their range that no animals are left behind.

Character of Butter.—At this as at other ranches, I tested nothing but fresh or newly made butter. The color was a light yellow, but much deeper than could have been expected from the dry and brown feed. The distinguished characteristic of all the butter I saw, was its solid, waxy texture. The flavor was fair, but it had less of that peculiar aroma which the finer fancy samples of New York butter possess. This may have been attributable to the condition of dry feed in part, and perhaps in part to the manner of manufacturing.

I tested the milk and buttermilk in numerous instances and found it of excellent flavor, and in no instance could I detect a taint or anything objectionable in flavor. I should say that such milk, in such a cool even climate, ought to make, if properly manipulated, the finest quality of both butter and cheese.

The Home Rancho.—This rancho is about ten miles west of Olema, a small village on the road to San Rafael. It contains three thousand acres, has four hundred and thirteen cows and one hundred and fifty-eight horses—mustangs, roadsters and lasso horses—including an imported English stallion, a thoroughbred racer.

Mr. Nichols, the very intelligent foreman of this establishment, informed me that there were about two thousand head of beef cattle connected with this rancho, or under his management, and four hundred heifers, which were being raised for cows. The beef cattle go to market at San Francisco, and other parts of the state, at three years old and upward, bringing from \$40 to \$60 per head.

The buildings at the Home rancho are commodious and more extensive than at some of the other places. They are situated in a lovely little valley, surrounded by round hills, over which the cattle roam and feed.

Butter is made here, as at the other dairies, and the appliances and mode of manufacture are similar to what has been previously described. From twelve to fourteen men are employed on the rancho, and they get at the rate of \$30 per month and board, for a period of six months, or during the busy season.

The hay here, like all California hay, consists of oats cut while the straw is green. About one hundred tons have been harvested during the present year, and this quantity has been grown on fifty acres.

Growing the Hay Crop.—Mr. Nichols says he begins to plow for the oat crop in November, sowing in December at the rate of one hundred and fifty pounds of seed to the acre. The crop is cut with mowing machines just before the oats have ripened, and as no rains fall during harvest time, the curing of the crop is accomplished in the most perfect manner. Upon this rancho they commence feeding stock in August and up to November, or until the rains begin to fall and fresh grass is started. The feeding in August is only occasional, and depends altogether upon the weather. If the weather is windy, so that stock cannot feed in comfort on the hills, an allowance of oat hay is given; but in mild weather, when the animals can get about over the range, no extra food is given. Beets are also raised here in considerable quantities for cattle food. They are cut up, roots and tops together, and each cow in milk gets a pail full per day. Stock run out over the rancho all winter, and during some seasons no extra food is required.

Cows commence dropping their calves in December, and continue till March, at which time it is desired that they should all be in milk.

Usually it takes the labor of four men to care for the stock on this rancho.

Here, as upon other ranchos, the "bunch grass," or gramma, is depended upon for pasturage. It grows with great vigor at all seasons, when there is sufficient moisture. It is enduring, and cattle prefer it to any other grass, thriving upon it, whether it be green, or crisp and brown, during dry weather.

The sour milk and buttermilk go to the hogs, a considerable number of which are thus fattened for market. They are sold on foot when ready for market, and bring from six to eight cents per pound.

This rancho is substantially fenced in, with red wood pickets, and the stock I found in remarkable thrifty condition.

I spent a night at the home rancho, and the two young Chinamen cooks served up repasts as toothsome as the famous cooking at the Occidental. It is true, the courses were not so elaborate, but the meats, and a great variety of vegetables, were dished up in a manner that would have delighted the most fastidious "good liver." And here a word may not be out of place in reference to

Chinese Servants—Everywhere in which they came under my observation, I found them neat, attentive, respectful, quick to anticipate one's wants, quiet in manner, and altogether "filling the bill in full," of what is understood by a good servant. The better class in San Francisco, who have had abundant opportunity of testing their faithfulness and capacity in the various relations of household work, are unbounded in their praise. They make excellent cooks, are unsurpassed as laundresses, and learn the ways and requirements of household work with a rapidity that is perfectly astonishing. And I could not help thinking what a vast relief it would be to the dairy-men of central New York, if this class of labor could be introduced. Now, all through the dairy districts of the east, it is extremely difficult to obtain male and female labor except of the most inferior kind. The cost, too, of labor is excessive and eats up the entire profits of many a man's farm. Hundreds of farmers are mere slaves to hired help—help that are indeed "lords of the manor"—who will not work unless they are watched; who take delight in wasting and destroying their employer's property; who are brutal to all animal life under their control or entrusted to their charge, and who hang like a dead weight upon the farmer's family, because they cannot be dispensed with.

Go among the farmers to-day through central New York, and hear how gladly they would rid themselves of this incubus, and do all the work on the farm with their own hands, if it were possible to do so. Not that they are unwilling to pay

for labor, but because they are obliged to pay for *inefficiency*—vexed, tortured in mind and body, and made slaves to the help they hire.

There is no place here to discuss Chinese immigration in its moral and social aspect, but the question of labor is growing every year and every day more and more intricate and difficult to be solved, and there is among farmers an irrepressible desire for relief.

Throwing the Lariat and Catching Wild Cattle in California.—We rise in “the gray dawn” and breakfast early, on the morning of August 2d, for Olin was to have a new four-horse team from the rancho and drive us out on the plains among the wild cattle; following Mr. Nichols and a band of old Californians mounted upon mustangs, and each armed with the lariat. This meant sport, and Olin drew his lines and handled his long lash in a way that plainly indicated there was to be no “small driving,” so long as he filled the box.

I had had a taste of “break-neck speed” the day before, down steep declivities, along the edge of mountains where a foot’s deviation from the track would have plunged carriage and horses in a shapeless mass below, making our hair stand on end at the reckless way he turned a corner or passed a ten-mule team on the edge of a precipice. But Mr. Howard assured us that “Olin’s head was level,” and that we were safe in his hands. So we shut our eyes over the worst places, and heard the whip crack and felt the carriage sweep and sway as it plunged after the galloping horses and slackened speed only at the next ascent.

And so this morning we dashed along over mountains, and down into deep canyons, until we struck a broad plain in sight of the cattle, and here we halted. Then we saw in the distance, the wild bulls, with flying tails, rushing over the plain, pursued by the horsemen. Now they plunge into the tall grass, and again the scamper and hurry of feet is heard as the horsemen turn the herd in the direction of the carriage. On they sweep in a body, led by a famous red bull, fleet as the

wind. The men urge forward their mustangs, dashing "pell mell" for the leading bullock. One of the horsemen is now ahead. We see him swing the lariat; but he is yet too far back of the frightened bull. Onward they come, the horse steadily gaining, and now the lariat swings round and round, and then shoots forward. Has he caught him? Yes!—No!

"By George! sir," the lasso is over his horns; but the end of the cord has been jerked from the rider's hands, and the bull bounds along uncaught. Then the race is pushed faster and faster, and the horseman is seen swaying over and almost touching the ground. He has caught up the dragging lariat, and with a loud bellow from the bull he is checked in his flight.

On come the other horsemen, and again a swing of the lariat round and round, and the mustang stops, holding from the pommel of the saddle the lariat, which is fastened at the other end to the hind leg of the bullock. Another horseman swings his lariat and clutches the foreleg, and in a moment the poor bullock falls upon his side, bellowing lustily in his fright and rage. Then the horsemen loosen the animal, and sweep off in a body after fresh victims, and thus bull after bull is caught, and cheer after cheer goes up from our carriage—for this, indeed, is rare sport, the most exciting and best we have seen in crossing the continent.

It is perfectly astonishing what skill these men have acquired, and how unerringly they throw the rope, and lasso the mark desired.

In their riding one can almost fancy them a part of the horse, for they can sway over and touch the ground when the horse is on a run; and they descend the steep declivities of high bluffs, urging their mustangs at their full speed, and you wonder how they can make these frightful rides without being dashed upon the ground, a mangled mass of broken bones and jelly.

Other Dairies.—Turning partly about, we drive to the Evans dairy, of one hundred and forty cows, and from thence to

other ranchos numbering from one hundred and fifty to one hundred and sixty cows. At these places the buildings, management of cows and manufacture of butter, are all on the same plan as that previously described. At some dairies the average yield of butter at the time of my visit, was at the rate of half a pound a day for each cow; but in the best season, it had been from a pound to a pound and a quarter. At one place of 1,200 acres, I found a corral of heifers, a hundred of which were two years old, and fifty were three years of age. Here, during the early part of the season, the average daily make of butter was one pound per cow. These heifers were of fine form, with a good proportion of Short-Horn blood; and Mr Howard thought at four years old, they would make an annual average of two hundred pounds of butter per cow.

System of Farming, Suggestions, &c.—The system of farming over these lands is now, of course, rude and wasteful; but Mr. Howard is organizing a plan for the application of manures. What it seemed to us should be done, is to divide the lands up into smaller farms—say of capacity to keep a dairy of seventy to eighty cows—and then establish butter and cheese factories at convenient points, where both cheese and butter can be made on the associated system. In this way the estate would become better colonized, schools and churches would grow up, and the families would not be so isolated. At the same time by relieving the tenant from the manufacture of dairy products, more time and opportunity would be had in improving farms.

Mr. Howard thought it quite probable, now that a division of the estate had been made, that dairy farms could be purchased at very reasonable prices, say \$25 to \$30 per acre. Considering the climate and the nearness to the markets on the Pacific coast, the situation has many advantages for practical dairy-men who desire a residence on this part of the continent.

Looking out on the Pacific from the most Western Limit of Central California.—Desiring to see the most western limit of central California and come face to face with the broad Pacific, we

kept on our way to the rocky cliff, or sharp point of land jutting out into the ocean, the extreme point of Point Reyes. Here the government light house is in progress of erection, Mr. Howard having sold to the United States a hundred acres for that purpose.

Looking down the cliffs upon the rocks, upon which the waves of the ocean were dashing and throwing up columns of spray, while the unceasing moan and sobbing of the mighty waters echoed along the shore, the sight had a sublimity which made a deep impression upon our hearts, and one never to be effaced from memory in this life.

Here and there the seals were basking upon the rocks, or making their way in the foaming waters, now and then exposing a head above the waves that made us almost fancy that they were human beings shipwrecked on the coast, and struggling to lay hold of the slippery rocks. Here we looked out upon the broad Pacific—as we had done a few weeks before upon the Atlantic, from the shores of Maine—hardly able to comprehend how the journey across the continent had been made in so brief a time, and with thanks and praise in our hearts to the good God who had permitted us to see all these wondrous works of his hand, and who had held us without harm in his holy keeping; and then we turned our way back over the rancho to San Rafael—a journey through the country of nearly fifty miles, which Olin, by a relay of galloping horses and incomparable driving, brought us over safely before midnight.

Cheese Making.—Cheese is manufactured in California, but the quantity is comparatively small. It is made in farm dairies, though one or two factories are soon to be established. I went through the storehouses in San Francisco and examined numerous samples of cheese. Some of it was very well made, meaty in texture and fair in flavor; but I saw nothing that could be called a “fancy article,” as that term is understood in New York.

One of the largest dealers in San Francisco had upon his

shelves about a half million of pounds. It was placed on shelves on each side of the store-house, extending from the floor to the ceiling. No samples shown me were in boxes, although the firm, I was told, dealt in New York factory cheese to some extent. With a climate so favorable for the production of good milk, and especially for the curing and keeping of cheese, I should expect California to be able to excel in the finer "fancy grades." Indeed, I know of no region having a temperature so admirably adapted to the production of clean, sweet-flavored dairy products as the coast range of California.

Influence of Climate upon Dairy Products.—The importance of a moderate, uniform temperature for the manufacture of choice dairy goods, can not be over estimated. Much of the butter and cheese made in the middle and eastern states during hot weather, is more or less affected in flavor on account of the overheated condition of milk as it comes from the cow. The driving of cows from the pasture to the stable when the temperature is from 90 to 100 deg., has a tendency to overheat and injure the milk of such cows before it is drawn, and it is extremely difficult to collect a herd together during the intense heat of our summers without over-exercising some of the animals to that extent that the milk will be feverish, and unsuited to the manufacture of fine flavored goods. Add to this the difficulty of making and keeping dairy products in a temperature not above 70 deg., when the temperature of the atmosphere is above 90 deg., and it will be seen why such vast quantities of butter and cheese made during hot weather are condemned as ordinary, inferior, and positively bad.

The summer of 1870, as compared with the season of 1869, practically illustrates my position. The season of 1869 was unusually cool and even in temperature, and at no time in the history of dairying has the aggregate annual cheese product proved to be of so uniform good flavor. The English shippers and cheese mongers were very greatly astonished at the marked improvement in the flavor of American cheese that year, and many attributed it to the progress which had been

made in American manufacture. The English shipper, Mr. Webb, in summing up his remarks on the quality of American cheese, says that "the whole season's make (of 1869) shows a *decided improvement in the average quality, and larger proportion of really choice cheese* than in any former year."

In my address before the American Dairymen's Association, January 12th, 1870, I pointed out quite clearly what, in my opinion, was the main cause of the marked improvement in the flavor of American cheese for the season then just passed; and I now quote from that address the following paragraph, as summing up my views on that point:

"Seasons like the past, (1869,) are exceptions, and the like may not occur again in years. It approximates more nearly to the summers in England than those common with us, and to the peculiar condition of the climate, more than anything else, may be attributed the general good flavor of our cheese the past season. And if there was anything more needed to establish the fact of climatic influence, reference may be had to the hot summer of 1868 in England, and the consequent depreciation that year of English cheese."

Now, the extremely hot weather of the year 1870, put its black mark upon the cheese made during the time of its continuance. Loud complaints were heard among dealers in all the markets, of the "hot, strong flavor" of nearly all the cheese sent out by the factories from the middle of July to the middle of August. And this condition of things will prevail more or less during every hot summer until some plan is inaugurated in the construction of curing rooms, so that temperature may be controlled; and even then the trouble from faulty milk, on account of overheated cows, will not be obviated.

It will be seen, then, what an immense advantage in climate the coast range of California possesses, where the average temperature is about 60°, and the highest heat seldom goes above 70°. The advantage of mild winters in saving of fodder, requiring the storing of comparatively little fodder to carry

stock along, has been alluded to. This point need not be enlarged upon, since dairymen who are accustomed to feed stock during our cold winters, where six months' store must be provided, will at once appreciate what advantage a milder climate is to the stock keeper.

Wherever, therefore, there are grass lands in California having the climate I have indicated, they should be employed for dairying, and they will prove in course of time, I believe, more valuable than the grain lands; and even now, taking one year with another, can be made the most remunerative.

Markets.—Of course, the question of markets is one to be considered; for if the time comes when the Pacific slope has a surplus of dairy products, where is to be the market or outlet? I believe a very profitable trade could be opened with China or India for this class of goods. Indeed, some of the San Francisco dealers told me that shipments of cheese had been made to China, and with good profits to the shipper, the only objection being that the length of the voyage made rather slow returns. But a regular and steady trade opened is a different matter from chance shipments, and hence I see no reason why the dairy could not be made remunerative and enduring upon the Pacific slope. It is quite probable, for some time to come, that home consumption and home trade will take all the cheese that will be likely to be made upon this slope.

Milk Dairies.—Wherever there are large cities or considerable towns, a supply of milk must be had, and milk dairies naturally follow and develop into a specialty. I was unable to get statistics as to the quantity of fresh milk used in San Francisco, but I obtained some facts in regard to one of the largest dairies employed in furnishing fresh milk for city consumption, and this was the

Dairy of A. F. Green & Co.—It is located at Millbrae, in San Mateo Co., and numbers six hundred cows. San Mateo county lies south of San Francisco, and is bounded on the northeast by the Bay of San Francisco, and west by the Pacific.

The rancho where this dairy is kept, embraces about 6,000 acres. Three hundred and fifty cows are kept in milk all the time—that is, whenever any of this number dry up or fail in milk, others from the reserve are coming in milk to supply the vacancy, and thus the dairy is kept good all the year.

The average quantity of milk delivered at San Francisco from this dairy is seven hundred gallons per day. It is put up in cans holding three gallons, and sold to the milk-dealers at seventy cents per can. The transport of the milk from the rancho to the city, costs about four and a-half cents per can, which leaves sixty-five and a-half cents for the milk, or nearly five and a-half cents net per quart to the proprietors. The milk is retailed in the city at ten cents per quart. The average temperature upon the rancho is about 60 deg, and the milk is cooled off as soon as drawn by setting the cans in water tanks. In order to have the cans reach the city in time to be distributed by the milk-carriers, the cows are milked at 12 M. and 1 o'clock at night.

Management and Feed of Cows.—At this establishment there are extensive buildings for storing fodder and housing the cows. The cows run out to pasture every day through the year, but extra feed is commenced to be given about the first of July. The extra feeding is carried along as the cows require, generally up to the middle of February.

The pasturage from the first of November to the first of January is rather flashy, and is not alone of sufficient nutrition to keep the cows in milk. Young stock may, perhaps pick their living from it; still, it is not considered good economy to allow animals, whether young or old, to depend wholly on pasturage during this season. The pasturage begins to be good about the first of January, and continues to be abundant up to the first of July.

The extra feed adopted for this dairy consists per day for each cow as follows: ten pounds California hay, four pounds oil meal, four pounds Chili bean meal, and four pounds bran. The hay is cut and mixed with the several ingredients, when

it is steamed and the cows are fed of it morning and evening. Animals not in milk are fed loose hay.

Mr. Green informed me that barley straw, cut green, made the best hay. The barley is sown about the first of January, and the crop is cut the last of May, yielding at the rate of two and a half tons to the acre, if the land has been properly prepared and manured at the time of putting in the crop.

Mr. Green says that the most trying time for the dairy stock in California is from the first of November to the first of January, so far as feed is concerned; for, although the pastures begin to dry up and are brown in July, still there is sufficient nutrition in the "bunch grass" to carry the stock along."

The season of 1870 had been unusually dry, and more trouble had been had on account of the scarcity of water than for any previous year.

The cows in this dairy make an average of about ten quarts of milk per day for the year; but during the "flush feed" the yield is from four to seven gallons of milk to the cow per day. About the last of May or first of June the dairy is usually doing its best.

In answer to my inquiry in regard to preserving an even temperature in the milk room, Mr. G. stated that not the least difficulty was had in keeping it at 65° the year round.

Comparisons.—I have now given some of the leading features of California dairying. Having travelled over the dairy districts of Great Britain, France and Switzerland; with an intimate acquaintance of the dairy lands of the eastern and middle states; of the Canadas and several of the western states, I found upon the Pacific slope, conditions different from anything seen before. The climate, the soil and the grasses are different, and, indeed, as compared with other dairy sections, so unlike, that I often found it difficult to draw satisfactory conclusions.

Up to the present time stock has been kept upon extensive ranges. The soil is wonderfully productive in cultivated crops, but whether any of our artificial grasses can be intro-

duced to take the place of those natural to the soil ; whether, indeed, the bunch grass, under close cropping and long continued dairying, will prove enduring, are questions not satisfactorily solved.

While the climate of the coast-range is low and uniform in temperature, some of the valleys in the interior are intensely hot in summer. In the Sacramento valley the heat is sweltering, and, of course, dairying in such portions of the state could not profitably be carried on. The absence of meadows and the sowing of oats or barley for hay is a feature that at first would not strike an eastern dairyman favorably. Yet when it is taken into account that stock run out all winter in the fields, and comparatively little fodder is required, meadows, it would seem, are of very little account and can well be dispensed with. Looking over the country, as I did, at its worst season, when every thing is dry and parched, one would not be likely to be misled with impressions too favorable. And yet, from what I saw and heard, I was favorably impressed with California dairy lands. I found stock universally in fine, thrifty condition.

It was plainly evident that much less labor was required in the care and feeding of stock here than at the east ; that under ordinary management there must be a much less per centage of loss in stock from disease and accident, on account of the more favorable climate ; that fancy goods could be easily made, and that with proper skill in manufacture, poor stuff ought to be the exception rather than the rule ; that with the same prices for dairy products as at the east, large profits could be realized, because dairies could be managed at less expense, to say nothing of the difference in the price of lands. These, with other advantages, could not be ignored. And in saying this, I do not wish it to be inferred that I advise eastern people with good farms, eligibly located, and who are doing well, to pull stakes and go to California, for I believe something in the old adage, to "let well enough alone." Still, to young men seeking homes in the west, who are active and en-

ergetic, and have skill in dairy management, California, in my opinion, offers some inducements which cannot be readily found elsewhere.

CONCLUSION.

Cooking Food for Animals.—In conclusion it may not be out of place to refer briefly to the cooking of food for animals, as it begins to occupy the attention of dairymen.

Mr. E. W. Stewart, of N. Y., who has experimented and written largely on this subject says: "Steaming food is less practicable, but even more important than cutting. Cooking food for animals is of comparatively recent date. A brief notice of its rationale will demonstrate its importance, as well to animals as to man.

Perina says: "To render starchy substances digestible, they require to be cooked in order to break or crack the grains; for of the different lamina, of which each grain consists, the outer ones are the most cohesive, and present the greatest resistance to the digestive power of the stomach, while the internal ones are the least so."

"Starch," says Raspail, "is not actually nutritive to man until it has been boiled or cooked. The heat of the stomach is not sufficient to burst all the grains of the feculent mass which is subjected to the rapid action of this organ.

"The stomachs of graminivorous animals and birds, seem to possess, in this respect, a particular power, for they use feculent substances in a raw state. Nevertheless, recent experiments prove the advantage that result from boiling the potatoes and grain, and partially altered farina, which are given to them for food; for a large proportion, when given whole, in the raw state, passes through the intestines as perfectly unaffected as when swallowed."

Braconnot found unbroken starch grains in the excrement of hot blooded animals fed on raw potatoes; hence he adds, "The potatoes employed for feeding cattle should be boiled, since, independently of the accidents which may arise from the use of them in a raw state, a considerable quantity of alimen-

tary matter is lost by the use of these tubers in the unboiled state."

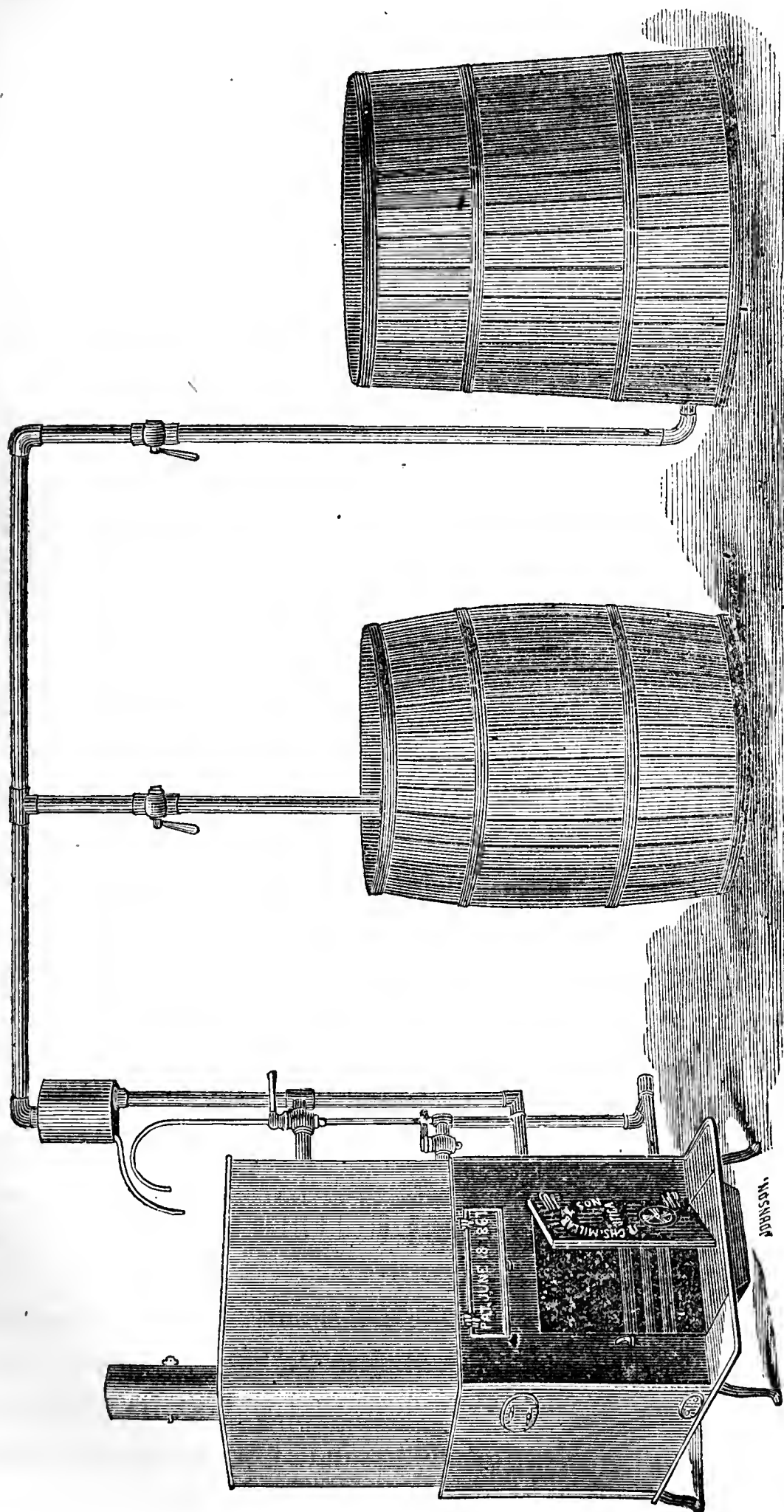


Fig. 43.—The Millar Heater as an Agricultural Steamer.

So much for the effect of heat upon grain and roots; but it may be asked whether we can derive the same benefit from cooking hay, straw, and other coarse fodder for stock. The following quotation from Regnault will show what difference exists between them, the stems containing woody fiber as well as cellulose, while roots and grains do not:

"A microscopic examination of the various component parts of plants shows them all to be constituted of cellular tissue, varying in form according to the part of the vegetable subjected to examination. The cavities of the tissue are filled with a very diversified matter; sometimes, as in the case of wood, the parities of the cells are covered by a hard and brittle substance called lignum, or woody fiber, which frequently almost completely fills their interstices; while, at other times, as in the grains of the cerealia, potatoes and other tubers, the cells contain a quantity of small ovoidal globules, varying in size, constituting ficula or starch; and lastly in the case of the young organs of plants, the cells contain only a more or less viscous fluid, holding in solution mineral salts and various organic substances. The principal of which are gum, gelatinous combinations, designated by the general name of *albuminous substances*." We conclude then, that if heat aids in rendering the nutritive principles of woods and grains more accessible to the assimilating faculty, it will also assist in softening the fiber of hay and straw. The cell walls which imprison the alimentary substances mentioned will, by the joint processes of cutting and steaming, be more or less broken and weakened."

The following extract from Johnson's Agricultural Chemistry shows the further effect of heat upon starch itself:

"When wheat flour, potatoes or arrow root starch is spread upon a tray and gradually heated in an oven to a temperature not exceeding 300° Fahrenheit, it slowly changes, acquires a yellow or brownish tint, according to the temperature employed, and becomes entirely soluble in cold water. It is changed into dextrine gum. During the baking of bread this conversion

of starch into gum takes place to a considerable extent. Thus Vogel found that flour which contained no gum gave, when baked, a bread of which eighteen per cent., or nearly one-fifth of the whole weight consisted of gum. Thus one result of baking is to render the flour starch more soluble, and therefore more easily digested."

Of starch, he says: "It is a property of starch of all kinds to be insoluble in cold water, but to dissolve readily in boiling water, and to be thickened into a jelly or paste as it cools."

It is supposed that, by digestion, starch becomes converted into gum or sugar, and the latter probably becomes absorbed. It is also an element of respiration, and according to Liebig, contributes to the formation of fat in animals. This theory is, no doubt, well founded, and explains the fattening of animals when fed upon Indian corn.

Referring to the preceding engraving, representing the coil heater and steamer, the only difference between it and the cheese vat heater is that a check-valve is substituted for the lower stop-cock to the tank, and the pipe furnishing the hot water or steam instead of extending out horizontal, is carried up perpendicular, and a steam separator is attached to which the steam pipes are connected.

The principle of its operation is this, when the stop-cock in the upper pipe is open, the water in the tank circulates through the coil and is heated in the same manner as in the cheese vat heaters, but when steam is desired this stop-cock is closed, the return of the water to the tank is thus cut off and it remains in the heater until steam is generated, when the mixed steam and water is driven up into the separator; the water being separated, runs back into the tank and the steam passes off through the pipes to the desired points. This will continue as long as the stop-cock is open. During this operation the coil is fed with water from the tank through the lower pipe.

UNDERDRAINS—HOW TO CONSRUCT THEM.

BY ELI STILSON, OSHKOSH.

The farming lands of Wisconsin that require draining, cover a greater area of the state than is generally supposed by the casual observer. While large portions of the land rest upon gravelly subsoil, already drained by nature, the amount of close or clay subsoil covers nearly an equal area, and requires more or less draining. Such lands when drained are among the choicest in the state. Underdrains are much superior to open ditches, for the purpose of draining these lands. The following are some of the most important of the many advantages which the first has over the other: The underdrains take up no portion of the land—the whole can be tilled; they present no obstruction to the use of machinery in cultivation; they have no banks to bake in the hot sun, and become impervious to water; they drain the land much more effectually; they render the soil light and porous, and allow the air to more readily permeate it, carrying warmth and fertility with it, and in times of drouth, oftentimes, sufficient moisture to carry crops through unharmed; they are rarely stopped up or injured by frost.

That underdraining is very beneficial in times of drought may seem doubtful to some, but if such persons will call upon the writer in the fall of the year, or during a drought, and take a short ride over miles of these drains, he will soon learn to point out the location of each drain, with every angle, by the luxuriant and dark green, second growth in clover and timothy meadows; proving conclusively that the drains are not only highly valuable in wet, but also in dry weather. This is caused by their rendering the lands light and porous, and easily reduced to fine particles so as to be readily soluble for

plant food, and absorb and retain moisture from the air which circulates through the finely pulverized soil.

Having made four miles of such drains on my farm, the experience that I have had coincides with the best authorities on draining, somewhat varied by surrounding circumstances, and may be of some use to those who have draining to do.

LOCATION OF THE DRAINS.

The price of farming lands in Wisconsin will not warrant the expense of what is termed thorough drainage, by making drains every 30 feet, or even every 60 feet. But on most farms with a tight or clay subsoil, there are lands which are too wet for profitable cultivation—a nuisance to the plow, seeder and reaper—causing much loss of labor and marring the beauty of the farm. Also in many fields, where the subsoil is generally composed of sand and gravel, there are pockets, or continued depressions between knolls, where the subsoil is stiff clay, and in some seasons worse than useless for cultivation. In these cases the proper position and course of the drains can be easily determined; in others the best location will be plainly suggested, if the farmer makes his observations in wet weather. It is often necessary to make a short open drain for the outlet. In this case two feet in depth will do for the under drain where it first enters the field, if no more can be obtained; but it is advisable to place it two and a half feet deep just as soon as the outlet and the fall in the field will admit. If the wet ground is narrow a single drain may suffice, but if wide and several drains are required, by making a branch or branches they may still have the same outlet. Where more than one drain is required for the wet belt of land it may sometimes be best to throw out short lateral drains, at an angle of from 50 to 70 degrees from the main drain, using only one main drain. Where there are wet pockets or detached wet places, throw laterals into them also. Care should be had that there is some fall throughout the entire drains. To secure this, it will often be necessary to dig more than two and a half feet at certain

places. A heavy shower before the drain is filled will test the level; but if the weather be dry and the land very level, so as to render the fall uncertain, then make a wooden level, by taking two strips of board three inches wide and eight feet long and miter them together so as to form the letter A, with the base so much widened as to have the highest point only four feet from the ground. Along the base nail a strip three inches wide and sixteen feet long, and six inches above this, nail another strip two inches wide. Now hang a plumb line from the miter joint and place the level on two bearings nearly level, and mark where the plumb line crosses the two-inch strip, and also mark the bearings where the level rests; then reverse the level on the bearings and mark where the plumb line again falls. Midway between the two marks is the true level; there place the true level mark, and the level is ready for use. With this, test the bottom of the drain, and if serious inequalities be found remedy them.

MODE OF MAKING DRAINS.

It will be necessary to determine the material of which the drains are to be made, so as to know the size necessary to dig them. The usual depths of all under drains should be at least two and a half feet; deeper than that would be better, but the labor will increase much faster than the increased depth. If tile are to be used, the drains may be dug fourteen inches at the top, and as narrow at the bottom as a person can work in. If the drains are to be filled with stone, placed so as to form the drain, they will require to be at least twelve inches wide on the bottom, and more if the stone are large. The large size required for stone drains, and the extra labor in putting them in, make them the most expensive, where the farmer has all the labor to hire. If the drains are to be made with pine fence boards, as many in Wisconsin are, they should be dug sixteen inches on the top, and the width of a spade on the bottom, care being taken to dig them straight, except where an angle has to be made. When a person makes his

own drains, some labor may be saved by plowing a narrow strip outwards twice or three times, having the dead furrow come where the drain is to be; but where the labor is to be hired, the spade is the cheapest. Some of it is done in this county for twenty-five cents per rod and board, including digging and filling, the farmer furnishing the board drain ready-made. The cost will be varied by hardness of sub-soil, as well as of price of labor.

Tile Draining.—The size of the tile should be regulated by the amount of water to be carried off; but few drains smaller than three-inch tile will be required, except where thorough drainage is attempted, or near the heads of the drains where the amount of the water is small, then smaller tile may be used. One serious hindrance in tile draining, in Wisconsin, is the high price of tile; another is the want of collars, made of the same material, to put over the joints, to hold the tile firm, so as to keep the drain perfect, and to admit water more freely. The best substitute at our command for collars is, after the tiles are fitted in a groove made in the solid ground in the bottom of the ditch, to cover the joints with a thin slice of turf of wild grass and then cover the tile with a little straw and fill with earth.

Board Drains.—Where pine lumber is cheap, and tile dear, the most economical drains can be made of selected pine fence boards, or two four-inch strips and one six-inch fence board will do where the amount of water is not too large. The lumber should be selected free of sap, as this will last 20 to 25 years, except where the wash is carried from barn yards, then it will decay sooner. I have drains made thus, that have been in use 15 years, and are in good condition. Strips of boards should be used six inches long and three inches wide, and halved or shouldered one inch at each end, and placed cross-wise of the board tile to hold the sides apart. One such cleat should be placed every four feet, both top and bottom—those on the bottom may be nailed with 8's, and then the wood tile

placed right side up, and after the cleats are placed and top board laid on, nail with 10's through top board and cleat, and then saw off each end of the board tile square. There will be an open space of one-half of an inch between the top board and sides, but the weight of earth will close this except near the bearings, and those small spaces will materially help the drainage. Care should be taken not to use unsound or sappy lumber, as it will soon decay. Place a flat stone on each side where the ends come together to hold the joints even, and cover with straw and fill with dirt.

Stone Drains.—When made of stone the drains should be dug at least twelve inches wide on the bottom, and more if the stone are large. Place a row of narrow or small round stone on each side, and cover with large stone. The cover should be so made as to keep out the dirt by filling in small stone in the crevices, taking care to keep the channel for the drain perfect. For slate, or very thin stone, dig the drain ten or twelve inches wide on the bottom, and set one tier of stone leaning against the bank, and then another tier leaning still more against those, and so on, until the drain is full one foot deep. Drains may be made of small fence rails, free from bark and sap, that will do considerable service. Brush and willow are sometimes used, but they are of short duration. A farm can be drained with a small capital in a term of years, if the farmer after making a few drains will only apply the increased production to the payment for making more drains annually. The making of a good farm is often the work of a lifetime, and the profits of farming are often very small, but money expended judiciously in draining a farm will pay better than if invested in an increase of acres. In fact, the farmer has several farms lying under each other, if he will drain off the water and let in the air, plow deeper and till the soil well. In this method, with a proper rotation of crops, with clover, plaster and other fertilizers, with a good supply of stock, a farm will continue to increase in production and profit; so that the farmer, after long years of toil, can sit down under his own vine, and reflect

with pleasure that he has added to his own and his family's comfort and wealth, and to the agricultural wealth of the country; having made the discovery that his title deeds extend downwards more than four inches from the earth's surface. The elements for making productive farms are abundant, and are within the reach of the farmer if he will study well his calling, and not be in haste to get rich by impoverishing his land. If he does this, in the end it will surely impoverish him.

THE MAPLE FAMILY OF TREES FOR CULTIVATION.

BY H. H. McAFEE.

The Acerineae of the northern United States consists of 1, (*Acer Pennsylvanicum*), Striped Maple; 2, (*A. Spicatum*), Mountain Maple; 3, (*A. Saccharinum*), Sugar Maple; 4, (*A. Nigrum*) Black Sugar Maple; 5, (*A. Dasycarpum*) White Maple; 6, (*A. Rubrum*), Red Maple; and 7, (*Negundo Aceroides*), Ash Leaf Maple; all of which are natives of the state of Wisconsin. It is probable that closer study will develop the fact which is now suspected, that an eighth species exists here also; and on the Pacific slope one, and perhaps three more species may be found.

The characteristics of economical value which this genus of trees possess, will form the subject under consideration in this paper.

As fuel trees, every member of the genus is valuable, but the Sugar Maple is pre-eminent in that respect, its wood being the very best fuel-wood known, with the sole exception of the White Hickory, (*Carya Alba*).

The wood of the maples rank in the following, order as to value for fuel: 1st, Sugar Maple; 2d, Black Sugar Maple; 3d, Ash Leaf Maple; 4th, Mountain Maple; 5th, Striped Maple; 6th, Red Maple; 7th, White Maple.

But owing to the peculiarities in composition, much of the value of maple wood as fuel is soon lost, if seasoning does not take place rapidly after the trees are cut. The sweet principle of the sap soon changes to a destructive acetic ferment, and if allowed to act for one summer, often reduces the heating qualities of the wood from 25 to 40 per cent. Maple wood, therefore, should be at once cut and split to proper dimensions

for burning, and then dried as rapidly as sun and air will dry it. Such treatment would accomplish a saving of many thousands of dollars in value, which is now annually lost by piling green maple in large sticks for a year before use.

For lumbering and manufacturing purposes some of the maples are exceedingly valuable, the veins and curls of some of the finer specimens are unexcelled for beauty by any other ligneous growth. And when the better taste in inside work in buildings, which dispenses with the painted wood, and puts in its place our beautiful native woods, oil finished, shall prevail, the many beautiful forms to be found in the maple woods will be better appreciated and more used.

But it is chiefly as a producer of sugar that the maple family is known and prized, and the thousands of tons of the most delicious sweet which the wild maple forests have given up at the call of the frontier settler, entitle the family to the respect of all, and to the admiration of the domestic economist.

All the maples will yield sugar, but the different species vary in the quantity of sap which they will flow, the percentage of sugar in the sap, and the quality of the sugar.

Black Sugar Maple will yield the largest percentage of sugar. Cases are known where the yield was as high as 7 per cent., though ordinarily it is about 4 per cent.

Sugar Maple will average about 2 1-2 per cent. from old trees, less from young ones. Nos. 1, 2, 5 and 6 are seldom tapped, as the sap is not rich enough in sugar to pay for the trouble of evaporation, the yield being generally less than 1 per cent.

Ash Leaf Maple has been experimented upon as a sugar producer by many individuals in various localities and always with favorable results so far as yield of sugar was concerned. The largest yield reported was obtained by Dr. Ennis of Lyons, Iowa, who states that he got 5 per cent. The writer, in the spring of 1868, obtained 3 8-11 per cent. from it, and others have reported getting from 3 to 4 1-2 per cent.

Taking into account the quantity of sap to be obtained from

a given size of tree, together with the richness of the sap in sugar, the Ash Leaf Maple stands at the head of the list, as it will produce double the sap of the Black Sugar Maple.

As to quality of sugar, the White Maple will produce the whitest, but with less of the peculiar, agreeable flavor of maple than the two sugar maples, while the Ash Leaf Maple, producing a light colored, easily crystalizable sugar, gives a peculiar flavor to the raw sugar which is unlike any of the other maples, and to some persons is rather disagreeable.

Three further points remain to be considered in the general comparison before the desirability of artificial propagation fully appears; they are the rapidity of growth, ease of propagation, and general vigor and health of the different species. A very considerable amount of observation, as well as considerable experience which the writer has had with maple trees, gives rise to the following estimates upon the points above alluded to :

	Rapidity of Growth.	Ease of Propagation.	Hardiness and Vigor of Habit.	Average Diameter of Trunk at twelve years old.
1. Striped Maple	4th..	4th..	6th..	5 inches.
2. Mountain Maple (A large growing shrub) .....	.....	.....	.....	.....
3. Sugar Maple	5th..	5th..	2d ..	4 inches.
4. Black Sugar Maple	6th..	6th..	3d ..	3 inches.
5. White Maple.....	2d ..	2d ..	5th..	8 inches.
6. Red Maple	3d ..	3d ..	4th..	7 inches.
7. Ash Leaf Maple.....	1st ..	1st ..	1st ..	10 inches.

If this estimate is correct, and it is made with the best light of observation and experience, it places the Ash Leaf Maple tree, third as a fuel wood, first as a sugar producer, first as a rapid grower, first as to ease of production and first as to hardiness and thrift; making it the most desirable maple for general culture. But whether any of the maples are profitable as a crop to raise, is a question which must be answered affirmatively in the minds of husbandmen before they will plant largely. In the writer's mind, the following reasons have led to such an affirmative answer: 1st. The seed of the Ash Leaf

Maple is so abundant that it can be readily gathered with good profit at \$1.00 per bushel; each bushel of seed will produce from nine to sixteen hundred trees of from 9 to 18 inches high the first year, at a cost for seed, planting and culture, not to exceed twenty-five cents per thousand. The summer of 1870, so terribly dry that every crop suffered, and many were ruined, still gave a good crop of Ash Leaf Maple seedlings, rather undersized, but healthy and straight. Five thousand yearling trees may be properly planted upon an acre about 2x4 feet, at a cost of \$3.00, which, with \$1.25 the cost of raising the first year and \$2.00 for pulling and handling, makes a total of \$6.25 for an acre stocked with trees.

Three years culture as good as is given by good farmers to their corn crop, and pruning at a expense of about \$2.00 per year, will put the grove beyond further call for labor or expense till the time for the harvest of fuel and sugar comes round. To tabulate these estimates, the account will stand as follows, leaving out of account the cost of land or rental value:

One acre of Ash Leaf Maple, one year old, planted about	
2x4, costs.....	\$6 25
Three years pruning, at \$2.00.....	6 00
Three years culture at \$2.75	8 25
	<hr/>
	\$20 50
	<hr/>

CREDIT SIDE.

At five years old 2500 poles 12 feet long and 3 inches in diameter at the base will make if corded up, 8 cords of wood, which is worth anywhere in southern Wisconsin, \$2.50 over cost of cutting and hauling	\$20 00
At ten years of age, trees 7½ inches in diameter are ready to tap, and will yield with 8 days of good sugar weather, 2 gallons per tree, or 5,000 gallons of sap of 3 per cent. sugar, or 1200 lb sugar worth 10 cts., per lb. \$120 00	
Deduct cost of working, 10 days labor for two hands, and interest upon apparatus.....	40 00
	<hr/>
	80 00
	<hr/>
	\$100 00
	<hr/>

(Fuel costs nothing, for the grove supplies it from the underlings which are better cut out.)

At ten years old, then, this acre has paid back at the rate of eight dollars a year over all expenses, except rental and inter-

est, and it is only at the threshold of its usefulness, as the sugar product will increase up to 3,000 pounds per year, while the proper thinnings will yield a handsome remuneration in fuel.

Objections may occur to many, or all of these figures, and in reply the fact may be urged that though they had been taken from an actual transaction, it would be no proof that everyone would be able to do just the same thing if they tried; but the cost of picking seed given; the cost of raising yearling trees given; the cost of transplanting given, and the size at the stated age, *were* taken from actual transactions and actual measurement, and as to the amount of sap per tree at ten years old, the writer got two quarts of sap in one days' flow from a tree but three and a half inches in diameter, and from a tree of sixteen inches diameter, and nineteen years old, two and a half gallons ran in one day.

These facts and figures are given with a purpose of drawing public attention to this subject, in hopes that experiments may demonstrate the usefulness of a neglected and comparatively unknown tree, which has, in the writers estimation, claims upon the earnest attention of everyone interested in the domestic economies. It was not without long and laborious effort that the beet plant was brought forward as a rival of the southern cane, and even yet, owing to the peculiarities of its constitution, the capital and skill required to manipulate it, render it almost uncertain whether beet sugar manufacture, as a permanent industry will be profitable. But here is a tree which yields the same sugar by simple incision and evaporation, needing no very costly apparatus to make a good quality of sugar, and hence just suited for domestic manufacture, which will employ time profitably, at a period of the year when farm labor is not exacting, and which may be carried on by nearly every prairie farmer of Wisconsin, and in time give a home supply of the commodity which taxes us so heavily when imported and brought from afar.

The slight purification which the ash leaf maple sugar needs to make it in every respect equal to cane sugar of the south,

is as easily accomplished as is that of the southern raised sugar, and some of the best samples raw are equal to the C coffee sugar of commerce.

A few plain directions for planting and growing the maples may be of some interest here, and are appended.

The earliest maple to ripen its seeds is the White Maple. And the Red Maple seed ripens soon after. As a rule, maple seed should be planted about one inch deep in mellow soil, within a short time after it falls, or it may be plucked from the tree when ripe and immediately planted. Clean culture is imperative, and for the first year the little trees may stand from 11 to 20 to the foot in drills. The seedlings may be pulled in the fall or in the spring early, by cutting the tap root with a sharp spade eight inches from the surface.

To plant a forest, run a corn marker over the ground one way. One hand with the trees, and one with a spade following the mark; plant by thrusting the spade perpendicularly two-thirds its length, then bear the handle back a foot, then thrust again clear down and bear the handle forward to give an opening back of the spade for the roots; put in the tree, withdraw the spade and tramp.

Use will soon make these motions rapid and certain, and two can plant 6,000 trees per day. Culture must be clean till the trees in foliage fully shade the ground. Sugar Maple and Black Maple ripen seed in the fall, and they immediately drop.

Ash Leaf Maple ripens seed in the fall, but it is persistent, often hanging till spring. The seed of this tree may be planted spring or fall, and does equally well at either season.

Four acres to each quarter section of cultivated land in Wisconsin, is not too much to be planted to the Ash Leaf Maple, and though the writer is heartily in sympathy with all tree planters, be the subjects of their care what they may, and though the prospective profits to flow from tree planting are not by any means confined to the family of trees under consideration, yet he must state, that it is his firm conviction that no other sort of tree whatever can be so profitably, and should be so generally planted as the Ash Leaf Maple.

HORTICULTURE FOR FARMERS.

(From a Paper read before the Wisconsin State Horticultural Society.)

BY J. S. STICKNEY, WAUWATOSA.

When the love of good fruit is so general, why is it not more abundant? When the value of trees for ornament, shade and timber is so apparent, why do we not plant more and care for them better? When beautiful flowers add so much to the innocent pleasure and happiness of our homes, why is there a home without them? There must be reasons and also remedies for these failures. To learn the one and apply the other is worth our honest efforts. True our climate is not all we could wish it to be, but complaints from us will be in better taste after we have fully accomplished all that our climate favors. True our nurserymen and horticulturists, and our State Horticultural Society might have done more to encourage and direct us, but we must remember that they have had many obstacles to overcome, and as all give evidence of now being alive and in earnest, let us assist with equal zeal. Without further considering these outside influences, let us look directly at home, holding ourselves responsible for whatever is less than it should be. A brief review of our short comings, if not exactly pleasant, may help us to make better progress hereafter. Let us who have lived ten years in our present homes consider what those ten years should have enabled us to do, with the best use of means actually within our reach. The seeds of that bushel of apples which we bought and used ten years ago, if planted and cared for, should now be represented by ten acres of bearing orchard, whose fruit in favorable seasons, should bring one thousand dollars. Is there such an item in our farm account? If not, we have lost something by neglect. If our farms lack timber or shelter, one bushel of black walnuts, to be gathered in an hour, or bought for a dollar, would, with prop-

er treatment for the past ten years, have given us lines and groves of trees that we would not sell for one thousand dollars. Are these on our farms, or are they still to be grown? One hundred evergreens, costing ten years ago fifteen to twenty-five dollars would now average fifteen feet high, making our homes models of beauty, and protecting them from many a wintry blast. Are the evergreens there, or do the piercing winds constantly remind us of their absence? Many smaller items of similar import will readily suggest themselves to your minds. Some of these things are doubtless lacking. And now comes the question, shall we still drift on in the old way, or shall we make an earnest effort to improve? The presumption is that all are anxious for improvement, therefore let us consider what are our best means of progress.

These horticultural matters need thought and study to make them successful. The leisure of winter is a good time to study and plan, and that these plans may not be forgotten, it is well to make notes of them, that shall bring them seasonably to mind. Much valuable aid may be gained from the excellent horticultural and agricultural papers now so abundant, and much by observing the work and progress of others. We also have books treating very fully upon flower, fruit and tree culture; but with all these, great and real progress can only be made by our own practical experiments. These, aided by reading and observation, must be our teachers; and even our failures may teach valuable lessons. Agricultural subjects will of course be first in importance with the farmer, and the suggestions I may make will be such as I feel sure will be no hindrance to other interests, and if carried out will yield rich compensation pecuniarily, and add largely to the comfort and happiness of farm life.

The things to be planted, and their arrangement, must necessarily be somewhat different on each farm, and it will greatly aid in deciding just what we would like to have, just what we can afford to have, and just where to place each particular tree and plant, if we make a full and complete map of the

farm, as accurate as to proportions as practicable, then study it carefully. Go also to different points of observation outside of your farm, and study the farm itself; consider where to place trees for ornament or shelter, that they may add most to the appearance, or afford most needed protection; if timber is needed, decide upon the ground best adapted, or that can best be spared for that purpose; in short, make of it in imagination a model farm; just what you would wish it to be regardless of expense. If you do this earnestly, with your heart in the right place, the chances are that you will see beauties and good qualities never before discovered, and that your farm will rise in value enough to pay for large improvements. Next decide how much of this plan you have the means and ability to accomplish. Let your plans for planting extend through a period of five to ten years, allotting to each year its particular work; then you are thoroughly organized for business, and when your plans are carried out, the whole will be harmonious and beautiful. At first your progress may seem to be slow, but as each year adds its growth to the trees already planted, you will be astonished at the results, and wonder how so much could so soon be accomplished, and with so little cost. Perhaps, also, there will be a feeling of regret, that the beginning had not been made five or ten years earlier. Ready means to buy just what you need, and of as large size as is profitable to plant, will of course hasten forward your work, but without this you need not hesitate. Very little money will answer, and more of skill and labor will get you on almost as fast. One very good way is, after deciding what will be needed for five years' planting, to buy all of these of small size, at wholesale prices, and plant them out in nursery form in well prepared soil; then transplant to their proper places as size and time will warrant. Such trees suffer little in transplanting and cost but a very small outlay of money. Growing from seeds and cuttings requires still less of money, but more of time and skill. Perhaps the better way is to commence planting with large trees, and at the same time start those miniature nurse-

ries for future planting. The younger members of the family may be led to take great interest in the nursery trees, and if cared for and grown by them, they will not lose their interest, as both trees and children grow older.

In all we do, we should start with the firm resolve to do everything well. And the very foundation of this consists in deep and thorough preparation of the soil before planting. No amount of after culture will fully compensate for the lack of this. Choice of soil and aspect is also important. In fruits, all like a deep loam, but perhaps this is most essential to pears. Give grapes a southern slope, the warmer the better—high and dry. For most trees this southern aspect is about the worst, as they here get too sudden changes from cold to heat, and start too early in the spring. Give everything thorough drainage; nothing desirable will grow or remain long in health with stagnant water about its roots. Currants, gooseberries and raspberries can best bear some shade and moisture. While we would do everything practicable for the good of our trees, we must remember that it is possible to “kill with kindness.” We must be sure that our young trees are not made to grow too late in autumn. They should cease to make new wood by August 15th to 30th, and expend their remaining energies in thoroughly maturing and hardening up the wood already made. Otherwise the first frosts will find them soft and tender, and they will surely suffer. The proper treatment is to cultivate well, early in the season, and not stir the soil later than about August 1st. Trees, both in orchard and nursery, that grow too late, should be stopped by pinching off the young points.

The safest guide as to what varieties to plant, is to carefully examine the orchards in your vicinity, and plant such as you there find doing best. This is a matter of great importance, for in almost every orchard you will find three or four kinds actually producing more fruit than all the others. Six to ten kinds are all that are desirable for profit in any orchard. As a rule, two or three years old, and four to six feet high is the best age

and size to plant. Always prefer low heads. Such trees will grow better, bear earlier and live longer. An excellent practice—but one often neglected—is to protect the south side of the body of the trees, the summer after planting, and for several winters following, with straw or other material, from the sun. In summer this guards against excessive heat, and in winter against sudden changes when we have freezing nights and warm, sunny days.

Small fruits yield the most immediate returns and should receive their full share of attention. First in season are the strawberries, and they come at a time when we are hungry for something fresh and new. They find a hearty welcome when placed on our tables, even though it be three times a day. During the strawberry season I daily see my farmer friends taking home their quart or two of berries from the market, and I feel like asking them to stop and explain how it is that, instead of these occasional quarts of stale and injured fruit, they are not daily using from four to eight quarts of much finer quality, grown in their own gardens. Certainly it cannot be because the good wife would object; nor because the children do not like them; nor because they are unhealthy. It would be unsafe to hint that men lacked either the knowledge or force to supply this need if they thought best, still there must be a cause for the general neglect of this and the other small fruits. Of course the larger interests of the farm must not be neglected; seed time and harvest must be promptly met and provided for; the farm stock must receive daily and careful attention; but there still should be time to attend to things that yield us so much comfort and luxury as do these fruits, and there should also be a spare hour, in which our thoughts might rest from the question of dollars and cents, and go pleasure seeking among the beautiful flowers and noble trees. These are called little things; and so are our lives made up of little things. If therefore these have been neglected, let it be so no longer. Make your plans now for a garden, if only of ten or twenty square rods, in which you will grow all

the small fruits in their season, and a variety of flowering shrubs and plants. Decide now upon the number of plants of each you will need, and take measures to procure them seasonably. Old and common varieties will do very well, probably give you more of success, and less of disappointment than many of the newer kinds. Make a good beginning with these, and try others with moderation, increasing the quantity as you prove them worthy. Material for quite a start may usually be found in the currants, gooseberries or raspberries, standing neglected in fence corners and by-places; re-plant these into good soil, and cultivate them well, and see how astonished they will appear, and how they will astonish you, with large, luscious fruit, that you never believed them capable of producing. Wilson, Green Prolific and Russell strawberries; Miami and Philadelphia raspberries, also Brinkle's Orange and Franconia, with winter protection; White and Red Dutch, Cherry, Black Naples, White Grape currants; Houghton and American Seedling gooseberries; Concord and Delaware grapes; all these you may plant with the assurance that they will not disappoint you. You should also plant a dozen or more roots of Linneus, Victoria and Mammoth pie-plant, and one hundred or more roots of asparagus. One thousand strawberries, two hundred raspberries, and one hundred currants, twenty-five gooseberries, and twenty grapes, will give a good supply for any family. If you plant much less you will doubtless come short of some things. For easy and thorough cultivation it is well to plant all in rows, so as to do most of the labor with a horse and cultivator or plow. If it is to be done by hand, it is sure to be neglected at times when farm work is pressing, and neglect, if not fatal, will destroy most of the profit, and all the pleasure.

The flower department requires but little space, and must receive careful hand culture. Our old time friends, the lilacs, snowballs, etc., are easily procured, and always grateful for the care bestowed upon them. Pæonies, phloxes, dicentras and many others, when once planted, need but the simplest

care; these, with a small assortment of roses, a few bulbs, dahlias, and a sprinkling of annuals from Vick or Bliss, will make the flower garden an object of beauty from early spring to late in autumn. In the orchard, the better varieties of Siberian crabs are worthy of a place, because of their early and constant bearing, and the excellence of their fruit for preserving, etc. If practicable, let apples, pears, plums, and cherries be planted in separate blocks, so that each may receive the peculiar care which its wants require.

What shall we plant for shade and timber? I answer, plant largely of evergreens, particularly of Norway spruce and white and Scotch pines. At least one hundred of these should be growing on every farm. The European larch is now receiving much attention, and I believe it is worthy of all the praise it gets. It is very rapid, growing, in ten to twelve years, to twenty-five feet high and one foot in diameter; it is also very durable. Young plants are abundant and cheap, and those needing timber cannot do better than to plant them largely. Wet soil does not suit them, but they thrive on dry, and even poor land. Three feet each way is the distance recommended by the Illinois planters, thinning out ultimately to twelve feet each way. Our native maples and elms are, perhaps, our very best street trees. Black walnut and white ash are valuable and rather free growing timber trees; if nothing else is accessible, cottonwood, poplars and willows can readily be grown from cuttings, and will be far better than none.

In this brief essay I have not aimed to treat anything fully. To give all a fair showing would require a volume; my only hope is to awaken in some minds an interest, which shall lead them to think and read upon the subject. If once fairly interested, they will put the knowledge they gain into practice; and tree planting once earnestly begun, is not soon given up. If some should become so interested as to form tree-planting associations, embracing neighborhoods, or even whole townships, and offering premiums for the most extensive and successful planting, great good would result; and the trees so

planted would in time become proud monuments to the memory of those who planted them. Always remember that in horticulture, a spring season lost is a year lost. If the work herein laid out is so great as to discourage, don't give up all, but plant something. Half a dozen apples each year will in time give you fruit. A single elm, planted by the roadside will be a landmark for you in later years.

Make good use of the knowledge you have. Seek more light in horticultural books and papers. Join our horticultural society; attend its meetings and report your progress. Plant trees and encourage others to plant, until the best of apples are abundant at fifty cents a bushel, strawberries and raspberries at six cents a quart, and grapes at five cents a pound. Verily that will be a happy time for the poor, and bad whiskey and tobacco will have fewer friends than now.

PROFITS OF BEE-KEEPING IN WISCONSIN.

BY R. Z. MASON, APPLETON.

During the years 1868 and 1869, much discouragement was experienced by the bee keepers in Wisconsin, and other portions of the northwest, by the general failure of the honey-harvest. The history of these two unproductive seasons, is about as follows: In the early part of May, 1868, till about the 20th of June, the atmosphere was, almost without interruption, dry and cold, with prevalent northeast winds. Honey was secreted to a very limited extent, and swarms of ordinary strength could no more than maintain their strength by their daily collections. The white clover, from which so large a proportion of our best honey is obtained, had hardly at the last date, made its appearance. But from this time on to the first week in August, we were favored with abundant rains and extremely hot weather. During this period vegetation grew with wonderful celerity. The bloom of our honey-bearing trees and flowers was exuberant, and such activity is rarely seen in the gathering in of the profuse honey deposits, as was witnessed during this, to the honey bee, eventful six weeks. At the close of this brief period another dry season set in, which lasted until frost made its appearance. During this year then, the bee had just six weeks in which to rear his young swarms, set them up in their new homes, and collect his winter stores. As a consequence, a large per cent., say 75 of all new colonies, died in the following winter from lack of food. This was the case with mine and nearly all my neighbors. I think also from a pretty extensive correspondence with bee keepers on the subject in different parts of the country, that the misfortune was general, and that a large per cent. of the young swarms of Wisconsin, and some of the old ones, perished.

The following year, 1869, a somewhat different state of things existed, but none the less fatal to the bee-keepers interests, nevertheless.

It was this. The whole country was flooded with heavy rains during the entire season when bees are most active and successful in the collection of their stores. Bees could hardly leave their hives without getting wet. If the day was sufficiently propitious to allow the more energetic and restless to get out of the hive, there was generally so much moisture in the air and in the capsules of honey-bearing plants, that what little honey there was, was thin and greatly diluted. What little was obtained then, was in a condition to ferment and sour before it could be sealed up. In the winter following, therefore, many colonies soon found themselves with insufficient supplies, and therefore perished, while others, that seemed to have acquired more honey, found their stores unfit for healthy nutrition, and soon died from dysentery contracted by eating unwholesome food.

It may be unsafe to say what precise proportion of the bees that occupied the stands of our Wisconsin bee keepers in the fall of 1869 perished before the spring of 1870; but competent judges, bee keepers of many years' experience, claim that the mortality was much more universal than in the year previous. Nearly all persons who began the business that year became disheartened and gave it up as a profitless, and thankless task. Many old and successful bee-keepers who had made this an important branch of home industry, lost every colony of bees they possessed. The calamity was so general and fatal that it will require three years of successful effort to restore these interests to the position they occupied in 1867. Prior to these years of disaster we had begun to suppose that bee keeping could be made profitable in Wisconsin. Since then many persons seem to doubt the proposition. The abundant deposits of honey in 1870 have, however, partially restored confidence among those whose faith in the profits of bee culture was never well grounded on the evidence of experience.

Now the condition of things so far as they affected the bee interests in the years above cited were unusual, extraordinary, if not abnormal. Such atmospheric conditions as were witnessed in the early drouth of 1868 may have been for a few times witnessed in our state before. But such a series of heavy rains as were realized in 1869 was perhaps never known since the settlement of Wisconsin.

We are of the opinion, therefore, that the climate of Wisconsin is generally very favorable to the interests of the bee-keeper. There are probably more days from April 1st to October 1st, so clear and warm and still that bees will fly, than in the Atlantic states in the same latitude. Our climate is not as humid as that on the Atlantic coast, where bees have done well for centuries. It is not, on the other hand, excessively dry. Our annual rain-fall is about twenty-four inches, or about one-half that of New York or New England. Few years pass in which we have an excess, or a deficiency of rain. We think on the whole, then, that the climatic conditions are eminently favorable for extensive and profitable bee-culture.

The only other question we need to discuss in order to decide whether bee-keeping can be made profitable in Wisconsin, is whether we have sufficient variety and extent of forage for the bee to gather his stores from. How is this? We have the willow, the poplar, the maple and the bass, which grow wild in our forests and by the side of our streams and swamps, from which large amounts of honey and pollen are annually gathered. We have also in every part of our state plants of indigenous growth, such as the white and red clover, buckwheat, dandelion, mustard, and many other varieties; while of exotics we have the celebrated alsike, or Swedish clover, and numerous species of cultivated flowers. But the staple flowers from which the bee must derive the bulk of his nectar are the basswood, the white and red clover, and the alsike. This last flourishes luxuriantly in every part of the state, especially on clay soils. In order to induce farmers to bestow more attention to this profitable exotic, I will here insert a quotation from a Michigan correspondent of the *Western Rural*:

“Alsike clover is not adapted to light sandy, or sandy and gravelly soils, with porous or leach subsoils. With good clay subsoil it succeeds better. But it luxuriates in rich, thoroughly worked clay-loam soils, rich bottom lands, prairie, and all marsh or swamp lands where they can be plowed so as to kill the wild grasses. Flowing through winter and spring does not injure it. Here it will accept the situation, and display its magnificent product on the scale of five tons of finely cured hay to the acre. But mark, deeply stirred, rich, moist land, underdrained or subsoiled, or both, will only produce this burden. The chemical action of plaster is strikingly manifest on this plant. Blossoms are developed more or less when the plant is from eight to ten inches in height, and when three and a half feet, it is a perfect sea of bloom.

“Millions of dollars may be added to the wealth of this country, especially in the west, in a few years, by sowing one acre this year, and gradually extending its area. For soiling cows, horses, etc., when pastures fail, it is equal or superior to green corn, and attended with much less trouble in the gathering and feeding. During the past year I cut three crops from the same ground, standing at the first cutting from two to three feet in height, as thick as it could stand, small, delicate stalks, with numerous branches, and perfectly glorified with a mass of small peach-blow colored blossoms filling the air with the most delightful and exhilarating perfume, and swarming with bees every fair day. The root is like red clover, but longer and more fibrous. The haulm, is small, tender, and nutritious. When well cured, as it should be, in full bloom, every spear will be eaten with avidity by all kinds of stock.

“There is no plant known that will produce so much honey, butter, cheese, beef, mutton, wool and hay per acre as this plant, not even excepting corn. In using the latter for soiling, you get only the haulm, while in the alsike, you get the haulm and a large yield of honey; and if the ground is prepared as well by deep tilth, manure and plaster, or other fertilizers, as for corn, you will get as much by weight of the haulm.

“It bears feeding to an enormous degree. I think its fattening qualities superior to the famous blue-grass of Kentucky; and as it will flourish well on such soils as I have designated, and from the Gulf to lake Superior, farmers can easily perceive its immense advantages to their pockets. Besides, the expense of seeding down every three or four years is saved. It is a great renovator and disintegrator of hard, tenacious soils. Its long tap roots and numerous fibres reach deep for its pabulum, and thus loosen the soil and endure drought well. Some think there are two kinds of this clover. I think not. The difference in growth, etc., in diverse localities is owing to the character of the soil. I never saw any but the large kind on land once covered with beech, maple, oak, bass, lever-wood, etc.; and I never saw any but the small kind on light, sandy, and gravelly soils. Also on pebbly soils, with calcareous debris, and good tenacious subsoils, it succeeds well. It is no humbug. Farmers, try it, and report results.”

This plant is a most prolific source of honey, and when introduced, as it will be, for other agricultural uses, it will supply to the bee-keeper, in every season, an inexhaustable source of bee-forage. At present, it is true, the white clover is the most abundant source of the bee-keeper's profits, unless we may except the basswood, so scattered through our forests. The white clover grows in every part of the state with great luxuriance. Early in June its bloom usually appears and continues until frost appears, about the first of October. Nearly every acre of pasture land, every road side, every meadow, and head land, abounds in white clover. If the estimates of honey deposits on a given area, made by Langstroth, Quimby and other bee masters, are at all correct and reliable, the supplies of honey, from this plant alone, are practically inexhaustable. The deposits of honey, says Mr. Kidder, on an acre of white clover, are 830 pounds per annum, and of course on a single quarter section, 132,800 pounds, and on every square mile, 531,200 pounds. But Alsike, instead of being less, is really more productive of honey than the white clover. If the above estimate is at all correct, millions of pounds or even tons of honey, remain in the capsules of our flowers ungathered, because the natural harvester is not introduced into the harvest field. This field invites its myriad harvesters.

If all who attempted to keep bees would master the science of bee-keeping, as a few only have, the results would be immense. The statisticians claim that if the pursuits of industry were followed fully up to the standard of the best authorities now known, the single state of Indiana could support a population of 90,000,000. Now, on the other hand, it barely supports 1,500,000. The failure to do more, results largely from ignorance.

So in bee-keeping, the failure to achieve a greater result than what we now witness comes from a want of practical knowledge of the whole subject. Countless tons of honey now waste in our forests and fields because we do not learn how to

avail ourselves of the instincts of this little insect. To keep bees unskillfully, either in small or large quantities, is unprofitable. To manage them well, is to make money in the exact ratio of the numbers kept.

There is little danger of overstocking a country productive of bee-forage. Five hundred, or even a thousand swarms can be kept in a single apiary with marked success.

A colony of bees will not unfrequently add to the weight of a hive six pounds of honey in a day. This must, however, be regarded as an extra yield. But from the experience of the oldest bee-keepers, a well managed apiary ought to average twenty-five pounds of surplus honey to each colony, and during the same season throw out one good, early swarm. This for successful bee-keeping is a moderate estimate.

The honey from basswood and white clover, in boxes, at 25 cts. 79 lb.	\$6 25
The new swarm	5 00
Total	<u>\$11 25</u>

This is about what the profits of bee-keeping should be when managed on scientific principles—a munificent reward on the capital and labor. The bee costs no more labor or expense than that skill which will enable the keeper to preserve the colony in its normal condition during the vicissitudes of our climate. Suitable hives can always be had for this purpose. The balance of his treatment is not so much labor, as attention. Bestow this on him, and he will not only supply his own wants, but yours also. But what are the profits of bee-keeping in Wisconsin—not what they may be, but what they really are, among those who devote their time and attention to the pursuit? Even with those most conversant with the subject, the profits are, on the average, comparatively meagre. Mr. Adam Grimm, of Jefferson county, a few years since, claimed that seven pounds of surplus honey was as large as 500 or 1,000 colonies would yield on the average. Even this might be considered a fair compensation to the bee-keeper. The account would then stand thus :

Original cost per swarm.....	\$5 00
Interest per annum	50
Labor on each swarm	1 50
	<hr/>
Making a total debtor of.....	\$7 00
	<hr/> <hr/>

The credit, on the other hand, would be—

Seven pounds honey, at 25 cents per pound.....	\$1 75
One good, early swarm.....	5 00
	<hr/>
	\$6 75
Value of original swarm taken out debtor side, or added to credit.....	5 00
	<hr/>
	\$11 75
Deduct original cost.....	7 00
	<hr/>
Leaving balance.....	\$4 75
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This gives nearly 100 per cent. on the original investment. This is what the best bee-keepers usually do, according to Mr. Grimm's modest estimate. But we should remember that the man who cannot bring his bees to produce more surplus honey, in a fair honey-year, has not learned the art of bee-keeping to perfection. The above may be more than bee-keepers as a whole average. Their failure to do more must be attributed to their ignorance or unskillfulness. They are not masters of their business. They are not bee-masters at all.

But what can be done to increase the profits of bee-keeping by the aid of the honey extractor—which eminent experts claim, adds to the productiveness of the hive, from 50 to 75 per cent. during the season—and the advantages gained by the improved method of placing the empty box for surplus honey under the full box, by raising up the latter so that the bee can make his combs continuous from above downwards to the bottom, and the benefits gained by the introduction of the Italian bee, what can be done to increase the profits of bee-culture by using these, and all other real improvements, seems almost incredible. The pursuit now is barely remunerative enough to induce the few to persevere in a business that has proved profitless to most.

CRANBERRY-GROWING IN WISCONSIN.

BY G. N. SMITH, BERLIN.

The American cranberry, although a native of many of the northern states, has been found to a greater extent in Wisconsin, or that part of it lying west and north of Fox river, than in any other one, or perhaps, all others combined. Here is its home; the native vines grow with all the vigor and luxuriance of the best cultivated ones of the Atlantic coast; and in size of fruit, delicacy of skin and fine color, it stands unrivalled. From the first settlement of Berlin it has been supplied with the fruit, and in many seasons abundantly. In its earliest days the Indians had a monopoly of the business of gathering the crop, and realized often, to them large sums in the sale. In the year 1859, particularly, the crop was so large, that they were unable to gather the whole of it; but the succeeding year being an excessively wet one, the marshes were flooded during the warm season, injuring the vines to such an extent, as to require two other years for them to recuperate and again come into bearing. It was not until the marsh was ditched or partially so, and the surplus water taken off, that annual crops could be depended on. The first ditch was made by the town of Aurora, for the purpose of improving the grasses along the borders, but the effect was, to so increase the growth of the cranberry vines, that a few individuals commenced the business of growing them for market in the large cities. The portions of land best stocked with vines were bought and improved by ditching and building dams for draining and flooding at will. The enterprise more than realized the expectations of those engaged in it, and all investments in this direction never failed to be otherwise than largely remunerative.

Their success, as a matter of course, induced others to engage in the business, and those lands were largely purchased of the state, so that at the present time but little, if any, remain unsold. The whole number of acres of this marsh, may be estimated at fifteen thousand, lying in the adjoining towns of Aurora and Warren, and in its whole extent, is natural to the growth of the cranberry, the soil being composed of muck and silicious sand—seemingly of just the right proportions for a healthy growth of the vines; yet, of its whole extent, probably not over one-half or two-thirds of it is available for cranberry growing, for the want of facilities for drainage and flowage, and this is the great requisite in order to obtain full annual crop-bearing of the vines. Thorough drainage during the warm season, and flowing from two to four feet deep during the cold, is about all the improvements needed, as all the fruit gathered up to this time, is from vines of spontaneous growth on lands improved by ditches and drains, and no other labor put on them; this fully demonstrates that it is not necessary to cover the ground from four to eight inches deep, as practised by eastern growers, and by them considered to be an absolute requisite for success. By a comparison of the average yield per acre, “taking one year with another,” here, on our native marsh, with the best cultivated lands in New Jersey, it will be found that ours is fully equal. Whether this is owing to a more favorable soil and climate, remains to be ascertained, at any rate, the western grower has the advantage of commencing the business without the great expense of sanding the ground—enabling him to enlarge the business to an extent that would be utterly impracticable, if the operation of sanding was required.

By reference to an article in the United States commissioner's report of agriculture for 1869, entitled “The Cranberry Interest,” we find it stated that the average crop in New Jersey is as follows: “Taking one year with another, averaging the production of cultivated fields, wherever reported, probably one hundred bushels per acre is a fair estimate, at the time the vines come well into bearing.”

On enquiring of our largest growers, as to the average crop, the estimate is, "taking one year with another," at no less rate, and by some of them considerably larger. It is safe to say, however, that when the vines have full possession of the ground, one hundred bushels per acre is a fair estimate, although in several places, the past season, the yield was full two hundred bushels, and in some favored spots, much larger, showing conclusively, that our lands are as productive as any others, even where the greatest amount of labor and capital has been expended.

If we take into account the cost of establishing the business, it will be found largely in favor of Wisconsin, both as regards the cost and time necessary for a paying crop to be realized. Taking the figures of the writer before quoted, it will be seen that the "cost of planting and preparing varies with the character of the soil. The labor and expense of preparing the swamp land is much greater—the amount expended from the beginning until planting is completed, varying from \$300 to \$400 per acre, and in some instances reaching \$600 per acre, including ditching and embankments, dams and gates for regulating the flowing. After this there is an expense of five to ten dollars per acre for two or more years, till the ground is wholly coated with the vines, and the fruiting begins." Taking the lowest figures named as the cost per acre, say \$300,

Forty acres would amount to	\$12,000
Annual expense for two or more years, \$400.....	\$800
Interest three years, seven per cent.....	2,500

Cost of 40 acres in New Jersey	<u>\$15,300</u>
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An investment in Wisconsin, in forty acres of clear marsh, without vines growing upon it, but in condition for planting, well located for draining and flowing, would cost from \$10 to \$25 per acre,

Say the highest—\$25.....	\$1,000
Drainage, embankments, dams and gates.....	500
Setting 40 acres to vines.....	400
Interest for three years	400

Total cost.....	<u>\$2,300</u>
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Making a difference in favor of the western grower of \$12,000 in the amount of capital required to establish the business, a sum sufficient to purchase a well stocked bearing marsh here, paying an annual income of fifty to one hundred per cent. But a more desirable investment would be in lands stocked or partially so, with vines in a bearing condition, for which there are opportunities, as large tracts are held by companies and individuals, who are ready to sell portions of their lands to any who are prepared to improve them. Prices of such lands of course take a wide range, say from \$5 to \$100 per acre. Such an investment enables the owner to realize something annually, and furnishes vines for planting where needed. Until the last fall, but little has been done comparatively in transplanting the vines; from one to two hundred acres were then set, and the work will be continued this spring. The ground chosen for the purpose is open marsh, with a light growth of wire grass on it. This grass is considered no detriment to the growth of the vines; the distance apart is usually three feet, although, if planted closer they would sooner have full possession, yet the expense of course would be increased. The sod is punctured and one or more vines inserted and then pressed down with the foot; the growth is rapid, and it is seldom that one fails to grow. Often the vine bears a few berries the next season, they being of so hardy and vigorous habit, the fruit bud is not affected by transplanting. It requires three or four years before the vines are well established and a paying crop obtained. After that time they soon take full possession of the land; and continue to bear for years without other labor than to thin them out occasionally, as the fruit is better colored where the sun can reach them.

Although the cranberry has its enemies, which must be resisted and controlled, it has less than any other kind of fruit. The vine worm is the most formidable of all, but as yet has not been destructive where the land is well flowed, which appears to effectually control them. It is only on occasional years that they appear, and then, about the time the vine is in

blossom, say the last of June, or first part of July; making their webs in the top of the vine, they spread rapidly, and being gifted with a voracious appetite, the vines soon appear as if fire had passed over them, and the crop is effectually destroyed. There is another worm almost identical with the leaf roller found on the apple, which eats into the berries, but as yet has done but little mischief, and does not seem to increase. The remedy for the destruction of these insects, to be depended upon, is in flowing the land well up to the warm season, as this completely destroys the insects and their germs.

The number of bushels gathered the past season was a considerable increase on any former crop, probably a fourth larger, amounting to 33,000 bushels, or 11,000 barrels, yielding at a low estimate \$120,000. One-third, or less of this was expended in gathering, cleaning and marketing, leaving \$80,000 nett to the growers.

The largest yield was from Carey & Brothers' marsh, being 3,400 barrels; the next from the Sackett marsh, 2,600 barrels. J. D. Walter gathered 1,000 barrels from 40 acres. Ruddock Mason & Co., had 800 barrels; other marshes more recently improved had from 100 to 300 barrels each.

To realize the amount for which the cranberry crop sold for in wheat, it would require 12,000 acres, averaging ten bushels per acre, at one dollar per bushel, or in apples it would require 40,000 barrels at \$3 per barrel. These comparisons may perhaps give a better idea of the value of the cranberry crop.

It is expected that there will be a largely increased production of the cranberry; but as to an over production the growers have no fears, as an increased demand has fully equaled the supply, and they have realized from the last crop, the largest yet produced, higher prices than ever before obtained.

To those who desire to engage in fruit growing, this branch of it offers a wide and promising field, with a large per centage on investments. The amount of land adapted to growing the cranberry, is so small compared to the very large extent of territory, and its population wanting them, that it is reasonable

to suppose that prices will continue high, but should it be reduced one-half, the business is yet more profitable than most others.

The merits of the cranberry may be briefly summed up as follows: Of all the fruit bearing plants it is one of the hardiest, being unaffected by the extremes of temperature ; it is the most prolific, yielding more to the acre than any other ; after being established, it needs but little if any care and does not require renewal ; the fruit is popular everywhere, being the most esteemed where best known ; it is less perishable, continuing good the year through ; it can be transported long distances without injury, and retains its long keeping qualities in all climates ; its health giving properties are known and acknowledged, especially in all places where bilious diseases prevail. In this respect it stands unrivalled.

BREAD-MAKING.

BY PROF. W. W. DANIELLS, UNIVERSITY OF WISCONSIN.

The almost universal use of bread, from early historic times, is one of the many instances that exist, of an empirical art reaching a high degree of perfection, far in advance of the science that explains the causes of the somewhat intricate processes followed in its manufacture. And we find, even at the present time, on account of the great difficulty experienced in making reliable observations, all of the causes of the changes produced in bread making are not certainly known. Berzelius and Liebig claim, and bring many facts to prove, that the oxygen of the air is the exciting cause of the fermentation that takes place in the raising of dough, while Pasteur and others maintain that living organisms—microscopic fungi—are the active agents in producing this change. But whatever the cause of these changes may be, the changes themselves are well and certainly understood.

The flour of wheat—the only flour ordinary used in bread-making in America—contains, in round numbers, the following percents of nutritive material:

Gluten.....	11
Starch	70
Sugar	5
Gum	<u>3</u>

Besides these ingredients are found about ten per cent. of water and one-half of one per cent. of ash, or mineral substances. These proportions vary slightly with the locality from which the wheat is obtained.

The object of bread-making is to prepare this highly concentrated nutritive material for ready assimilation in the human system. As the process of digestion depends upon the readiness with which the food will mix with the saliva and

gastric juices, the wholesome properties of bread depend upon its proper mechanical structure, as well as upon its chemical composition. It needs to be so soft as to admit of easy mastication, and sufficiently porous to furnish a large surface for the action of the digestive fluids. To furnish these conditions as aids to the process of digestion, and at the same time to make bread that is agreeable to the taste, are the objects of the various manipulations through which flour passes from the barrel to the finished loaf with its light, soft, spongy crumb, and its rich brown crust.

When flour is mixed with water, and baked at a temperature so low as to be little more than a thorough drying of the dough, it forms a hard, almost vitreous mass that is insipid to the taste, and as the starch has not been changed, or at most but slightly changed, is not easy of digestion. Such is the unleavened bread of the Jews, and the sea-biscuit which on account of its dryness and easy preservation, may be carried without change upon long voyages by sea or land. This bread containing as it does, all the nutritive material of the flour, is highly nutritious, yet from its solidity and on account of its insolubility, it has a starchy insipid taste.

The term bread is now almost universally confined to the loaf produced by baking a mixture of flour with water of the consistence of paste or dough, which is made light and porous by carbonic acid gas generated within the mass by fermentation, or set free from materials used in its manufacture. The difference between bread and biscuit, consists in the lightness of the "raised" loaf, in place of the more dense cake produced when the dough is baked as soon as mixed.

The skill of the breadmaker consists, to a great extent, in the proper regulation of the process of fermentation, that it may continue sufficiently long to produce the desired lightness, and be checked before the mass is too light, or the acid fermentation has begun, which gives a disagreeably sour taste and smell to the bread.

To fully understand the cause of the lightness of the bread,

and the action of fermentation, it will be necessary to notice the properties of some of the constituents of flour as given above. The flour of all the cereal grains, contains certain nitrogenous ingredients, known as albuminoids on account of their near resemblance to animal albumen. These substances are classed together above, under the general term gluten. This nitrogenous portion of the flour, is the flesh-forming portion, while the sugar, starch and gum, are essentially fat-forming in their natures. The gluten of wheat flour, which consists largely of vegetable fibrin, contains also a minute quantity of a very soluble albuminoid, known as gliadin, or vegetable glue, resembling in many respects, animal glue. This gliadin being very tenacious in its nature, holds together the particles of vegetable fibrin, giving to the dough a peculiar adhesive quality. Now when fermentation begins, the carbonic acid gas liberated, is prevented from escaping by the tenacity imparted to the dough by the gliadin, while the expansive force of the gas is sufficient to cause the raising of the dough, the gas occupying the open pores found within the loaf.

It is in wheat only that gliadin is found in sufficient quantity. And it is its absence in rye, oats and barley, that causes the bread made from the flour of these grains, to be dense and heavy, as from want of tenacity in the dough the gases escape, instead of raising the mass into a light, porous, spongy loaf.

Various means have been devised to ensure the liberation of the carbonic acid gas necessary to give lightness to the dough. That earliest in use was "leaven," and we read in the early history of the Jews, of leavened and unleavened bread.

It is well known that many of the substances rich in nitrogen are most liable to putrefaction or decay, and not only undergo this change themselves, but induce decomposition in other compounds when brought into contact with them. To this class of easily fermentable substances belong the nitrogenous compounds found in the flour of the cereal grains.

The leaven, or ferment, so commonly used in bread making,

is dough in which this process of decomposition has begun, and which will impart active fermentation to other portions of dough with which it is mixed.

This is the common method employed among the peasantry of Europe, and is used to some extent in this country. "Milk risings" and "salt risings" are modifications of the same method in which fermentation is induced in new portions of flour, while leaven is dough preserved from a previous baking. On account of the offensive odor, and slightly putrescent taste imparted to the dough by this method of fermentation, yeast is much more generally used as a ferment, in America.

In the process of bread making, flour, warm water, a little salt, and the ferment are so thoroughly stirred together as to be uniformly mixed, when they are set aside in a warm place to undergo fermentation. This mixture constitutes the "sponge." When the fermentation—"raising"—has proceeded far enough, the time varying with the amount of ferment used and the temperature to which it is exposed, more flour and water are added and the whole mass is mixed by kneading until the dough is of uniform consistency, and the "sponge" is thoroughly incorporated in every part. This dough is then formed into loaves and again set in a warm place, that fermentation may be induced in the last portions of flour that have been added. When the loaves have become sufficiently light, they are baked, the heat of the oven checking the process of fermentation, and causing a farther raising of the dough by the expansion of the gas contained within its pores.

During these manipulations it is found that changes have taken place in the mechanical structure, and in the chemical composition of the materials that have been used. And it is to these changes that the well-baked loaf owes its savory taste and easy digestibility.

Experiment has proved beyond question that the gas which is the active agent in raising the dough is carbonic acid gas, and that the production of alcohol accompanies the process of bread fermentation, showing that it is of that kind known as

vinous fermentation. In the vinous fermentative action, the sugar of the flour—which is of that variety known as glucose or grape sugar—is converted into carbonic acid, and alcohol as shown in the following equation :



The alcohol thus formed is volatilized by the heat of the oven, and the carbonic acid, or at least a large portion of it remains within the dough, being imprisoned there by the glutinous paste formed by the gliadin and vegetable fibrin; and at the temperature of 212 deg. has been estimated as forming one half the bulk of the loaf.

The alcohol, which is always a secondary product of bread-making as above described, although amounting to less than a pint to each one hundred pounds of bread, constitutes an immense loss, when all that is evolved in baking the bread of a large number of people, is taken into account. Thus it has been estimated that the amount of bread annually consumed in London, necessitates the evolution of 300,000 gallons of alcohol, and the amount consumed in Germany each year, 7,500,000 gallons. As this product is an entire waste, efforts have been made in England to collect the alcohol dissipated by the heat of the oven. Large sums of money were expended for machinery for this purpose, but it was found that the small amount generated in a single oven would by no means pay the expense necessary to collect it, and all attempts to save this waste product have been abandoned.

In fermented bread there are two causes of loss or deterioration in the nutritious principles contained in the flour. First in the direct loss experienced in the conversion of the sugar into carbonic acid and alcohol, as above given, both of which are waste products except so far as they affect the mechanical structure of the bread. Secondly, the nitrogenous substances contained in the flour, in undergoing fermentation not only convert the sugar into other products, and induce a molecular change in the starch, but are themselves changed by this ac-

tion, and their power of imparting to the dough that tenacity necessary to prevent the escape of carbonic acid that it may raise the loaf, is destroyed. This injurious effect, only in an exaggerated form, is familiar to all in bread made from grown wheat, as all these changes are produced in the process of germination. Bread made from the flour of such wheat is moist, sweet and mucilaginous, and is invariably wanting in that light, porous, spongy texture which is characteristic of good bread. It is also darker in color, a change that always accompanies the conversion of starch into sugar.

To prevent these injurious effects, various substitutes for fermentation have been proposed, by which the carbonic acid necessary to give lightness to the dough, is furnished from an artificial source.

The means most usually adopted for giving the desired lightness to unfermented bread, is to add bi-carbonate of soda and hydrochloric acid, in proper proportions to the flour, instead of salt, when by the action of the acid upon the sodic carbonate, salt is formed and the liberated carbonic acid gives to the dough its desired porosity. In theory this process is all that might be desired, while practically it can hardly be regarded as successful. That it has never been more generally adopted may perhaps be partly owing to the difficulty of measuring and weighing all the ingredients, especially the acid and soda, both of which must be used in exact proportions, that the bread may neither be sour on the one hand, nor alkaline on the other. Another difficulty is the procuring of acid entirely free from injurious impurities, as all commercial acid contains a small amount of arsenic from which it can be separated only with great difficulty.

Another process, and one in which the manufacture of bread in large quantities, as in the bakeries of large cities, has been much more successful, is that used in the making of "ærated bread." By this process, flour mixed with a proper proportion of salt, is put in a strong air-tight cylinder, where it is mixed by machinery, under a pressure of about one hundred

pounds to the square inch, with water that has been charged with carbonic acid, something similar to the "soda water" sold at the confectioners' as a pleasant drink. By this mixing, the water charged with carbonic acid becomes incorporated with the flour, forming a dough, which as soon as the pressure is removed, assumes, by the expansion of the gas, the vesicular texture, and lightness of fermented bread, and is ready for the oven.

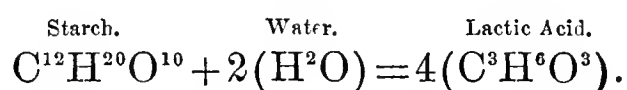
This bread is very wholesome, as it contains all the nutritive ingredients of the flour unchanged by fermentation. Yet it is objected to by many, as not possessing the agreeable flavor of well fermented bread. As its manufacture necessitates the use of expensive machinery, it can never come into general use except in large baking establishments. The writer knows of but one in this country, this is at Boston, and its bread is said to be quite popular. Certainly nothing more could be desired in the way of color and texture, than "ærated" bread possesses.

The important argument in favor of this substitute for fermentation, is the loss and deterioration necessary to that process. As before explained, these changes are induced by the nitrogenous portions of the flour, and are consequently greatest in that flour that contains the largest amount of these ingredients. Now, it is these same nitrogenous compounds that are most nutritious, as they contribute directly, when taken into the system, to the formation of flesh. Consequently, the loss will be greatest when the flour contains the greatest amount of these valuable compounds. They are found in largest proportion near the outer portions of the wheat kernel, and it is largely to their greater abundance in Graham flour that we may attribute the very wholesome nature of Graham bread. On this account a greater loss is experienced in the fermentation of coarse flour. The method of making ærated bread entirely obviates this loss. But in America, the color of the bread is considered a test of its value, being preferred for its whiteness. As meat enters so

largely into the food of our people, this question is not one of as great importance to us, as to those countries in which bread constitutes a larger, and meat a smaller proportion of the daily food of all classes.

It may not be out of place in this connection, to call attention to the wholesome properties of cracked wheat—wheat coarsely broken—as an article of diet. Containing as it does, all the nutritive properties of the original wheat; if so thoroughly boiled, that when cool it forms a glutinous, jelly-like mass, it is not only easy of digestion, but is the method of preparation by which a given amount of wheat furnishes the largest possible amount of nutritive material to the human system.

Besides the argument above given, there is another which favors the substitution of unfermented, for fermented bread, where circumstances are such that it may be done. If the process of fermentation, or rising, is not checked at the proper time, the dough becomes sour by the changing of a part of the starch of the flour to lactic acid, as is shown in the following equation:



This acid gives to the bread a disagreeable taste and odor, and is much more common when, from the use of poor yeast or an inferior quality of flour, fermentation has taken place but slowly.

To prevent this “souring” of the dough, bakers have long been in the habit of using certain mineral substances to arrest the development of lactic acid. Alum is the substance most commonly employed, although lime-water, and sulphate of copper are sometimes used. Alum, besides preventing the acid transformation given above, imparts to the bread a white, dry, crumbly appearance, and is on this account used in the manufacture of the baking powders that are now so commonly used, and is also often used by bakers to improve the appearance of bread made from poor flour. There are several objections to the use of alum in the preparation of food of any kind. Dur-

ing the process of digestion, starch is changed into sugar by the action of the gastric juices, and any substance that will prevent the conversion of starch into other compounds before it is taken into the stomach, will prevent it afterwards, and so interfere with ready digestion. Besides this action upon the bread itself, alum has a direct injurious action upon the mucus membrane of the alimentary canal. Being actively astringent in its nature, it not only interferes with the process of absorption, but has a tendency by long use to produce chronic constipation. Alum is also objectionable where bread is sold by weight, as in Europe, as it causes the retention of a larger amount of water within the loaf, and so increases the weight of bread from a given quantity of flour. This substance may be detected in bread by moistening a portion of the interior of the loaf with an alcoholic solution of logwood, made by digesting for twenty-four hours, 120 grains of chip logwood in eight ounces of alcohol. This solution gives to bread free from alum a straw yellow color, but a dark red, when alum is present. Sulphate of copper, on account of its very poisonous nature, should never be used, even in the smallest proportions.

When the loaf is subjected to the heat of the oven, fermentation is stopped, although the loaf continues to raise by the expansion of the gas contained within its pores, and at the same time the dough diminishes in weight from loss of water, which in bread from twelve to twenty-four hours after baking constitutes about two-fifths of the weight of the loaf.

The chemical change produced by the process of baking is confined to the outer portions of the loaf. When starch is subjected for some time to a temperature of 300 deg., it is changed into dextrin, a substance having the same composition but different physical and chemical properties, being soluble in water, and of light brown color. The crust of the loaf is simply that portion of the dough in which this change has taken place, and if of a dark brown color, has been heated to incipient decomposition. Toast owes its wholesome properties and sweetish, agreeable taste, to the formation of dextrin, by ex-

posing the bread to a high heat, and the solubility of this new product, is often taken advantage of in the preparation of toast water for the sick.

The interior of the loaf never reaches a temperature above that of boiling water, and hence the crumb of the bread is not materially changed in the oven, except the mechanical change accompanying the loss of water and the expansion of the gas. The object is to have it soft and porous, that it may readily absorb the saliva and gastric juices, by which it is dissolved and prepared to be taken into the circulation.

If allowed to stand for several days after baking, bread becomes dry or stale, a condition that is generally supposed to be owing to a loss of water.

This, however, cannot be the case, as if this "dry" bread be subjected to a temperature of 160 deg. to 180 deg., it regains much of its original freshness, which it could not do if drying were the cause of becoming stale. Indeed, experiment has shown that bread by exposure may become stale, and its freshness be restored by heat several times, while during all these changes but a slight diminution of weight takes place, and also that at comparatively low temperatures, bread will become stale even in an atmosphere saturated with moisture.

M. M. Boussingault and Thenard suppose this phenomenon to be due to a molecular change depending upon temperature, which takes place in the bread. Heat softens it, while at lower temperatures it hardens, a process somewhat analogous to the liquefaction and and resolidifying of wax or caoutchouc, produced by proper changes of temperature.

In ovens very little improvement has been made for many centuries, as those used by the majority of bakers of the present day, differ but slightly from those excavated from the ruins of Pompeii. In large manufacturing bakeries, however, some improvements have been made, of which W. E. Johnston, M. D., U. S. commissioner to the Paris Exposition of 1867, writes as follows: "The ovens of all good modern bakeries, are made on an inclined plane—an angle of 8 deg. in the best ovens.

This ascent favors the establishment of a current of heat, which is better than stationary heat, and it also promotes the circulation of the steam which is now universally introduced into ovens, near the mouth, while the baking is going on—an improvement which adds materially to the beauty and quality of the bread.”

The commissioner also in his report, in summing up the results of comparisons made at the Exposition, between bread mixed by machinery and that kneaded by hand, says: “both systems are good. That made by hand is generally regarded best for fine bread; the other for good ordinary bread, and for cheapness, for promptitude and great rapidity in the process of manufacture.”

He makes no mention in his report of “ærated” bread, but only of that fermented by yeast, from which it may be inferred that the latter is the only kind ordinarily made by the bakers of continental Europe.

Much is still to be learned in the art of bread-making. Not so much in regard to the manufacture of fine bread, as in the relation which this important article of diet bears to the food of a large portion of the human race, and in the cheap production of a wholesome, palatable bread. It is now almost universally regarded as excellent in proportion to its whiteness, and the fineness of the flour from which it is made. But there is little doubt that the coarser, darker bread made from the flour of the entire grain—except the outer covering or bran—and which is not so finely ground as the superfine flour so generally used, is more wholesome, not only because it contains a larger proportion of the most nutritious ingredients of the wheat, but also because of the extreme fineness to which the better brands of flour are ground, interferes with its ready digestion.

THE COLORADO POTATO BUG.

(Doryphora 10-lineata, Say.)

[From the American Entomologist.]

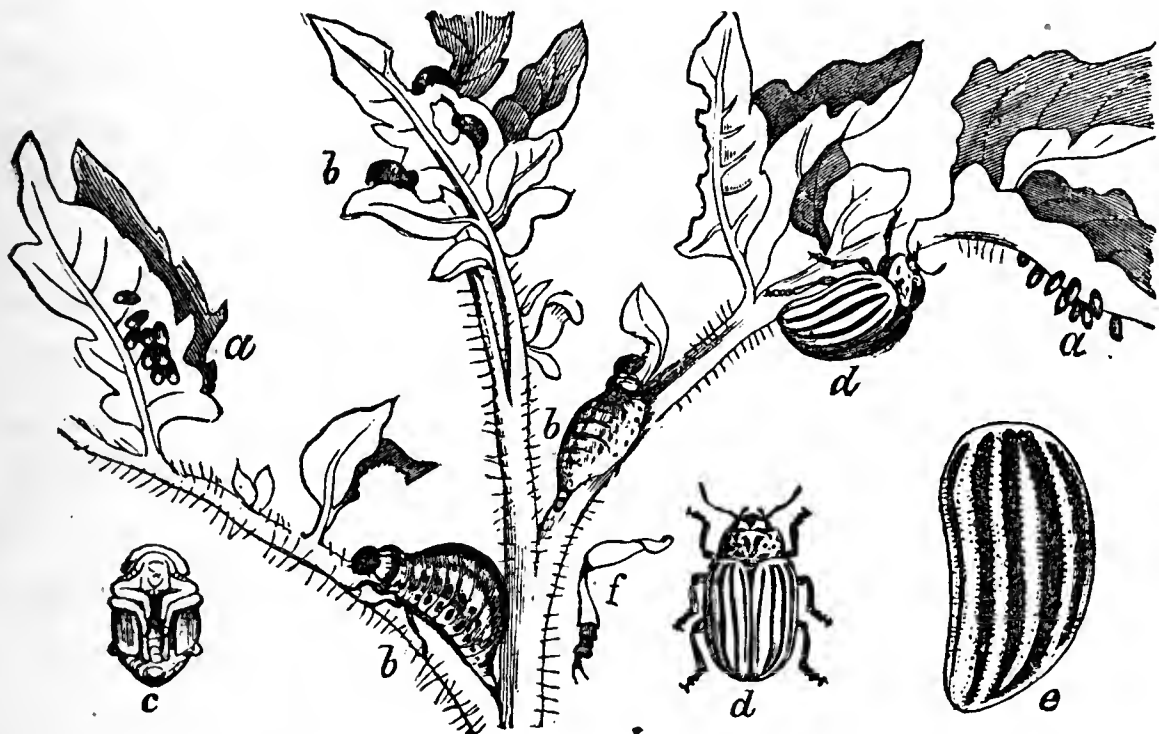
BY CHARLES V. RILEY.

Up to the autumn of 1865, it was generally supposed by Economic Entomologists, that this destructive insect had existed from time immemorial in the northwestern states, feeding upon some worthless weed or other; and that of late years, from some unexplained cause, it had all of a sudden taken to attacking the potato plant. In October, 1865, the senior editor of this journal published a paper, showing that originally its exclusive home was in the Rocky Mountains, where it had been known to exist for at least forty-five years, feeding upon a wild species of potato peculiar to that region (*Solanum rostratum*, Dunal); that when civilization march up to the Rocky Mountains and potatoes began to be grown in that region, it gradually acquired the habit of feeding upon the cultivated potato; that in 1859, spreading eastward from potato patch to potato patch, it had reached a point one hundred miles to the west of Omaha city, in Nebraska; that in 1861 it invaded Iowa, gradually in the next three or four years spreading eastward over that state; that in 1864 and 1865 it crossed the Mississippi, invading Illinois on the western borders of that state, from the eastern borders of north Missouri and Iowa, upon at least five different points on a line of two hundred miles; and that in all probability it would in future years "travel onwards to the Atlantic, establishing a permanent colony wherever it goes, and pushing eastward at the rate of about fifty miles a year." A remarkable peculiarity in the eastern progress of this insect was subsequently pointed out by the same writer in 1866, namely, that "in marching through Illi

nois, in many separate columns, just as Sherman marched to the sea, the southern columns of the grand army lagged far behind the northern columns."

Now, let us see how far the predictions above have been verified. By the autumn of 1866 the Colorado potato bug, which appears to have invaded the southwest corner of Wisconsin at as early a date as 1862, had already occupied and possessed a large part of the cultivated or southern parts of that state; and in Illinois, if we draw a straight line to connect Chicago with St. Louis, nearly all the region that lies to

Fig. 44.



Colors—(a) deep orange; (b and c) venetian red, inclining to cream color; (d and e) cream color and black.

the northwest of that line was overrun by it. It subsequently invaded parts of south Illinois, occurring in Union, Marion and Effingham counties in 1868; and already, in 1867, it had passed through the eastern borders of north and central Illinois into western Indiana and the southwest corner of Michigan, and finally, in 1868, it had reached Danville, Indiana, a point which lies nearly in the centre of that state, as we learned some time ago from Mr. A. Furnas of that city; and the agricultural papers have since recorded its appearance in Marion county, which lies in the geographical centre of the state. Thus it appears that its average annual progress toward

the east has been about sixty-two miles. At the same rate of progression it will touch the Atlantic ocean in A. D. 1878.

"But," it will be asked, "how could any entomologists make the mistake of supposing that the Colorado potato bug had always existed in the northwestern states?" The answer is, that, as was proved three years ago in the article already referred to, they indavertently confounded together two entirely distinct, but very closely allied species, the bogus Colorado potato bug (*Doryphora juncta*, Germar,) and the true Colorado potato bug (*Doryphora*, *10-lineata*, Say.) The former of these has existed in Illinois from time immemorial; and, as we have recently ascertained, through the kindness of Mrs. H. C. Freeman, of Cobden, south Illinois, feeds there in the larva state upon the horse-nettle (*Solanum Carolinense*, Linn.,) a wild species of potato, which grows, according to Dr. Asa Gray, "from Connecticut to Illinois and southward." The latter species, as has been already stated, only emigrated into Illinois in 1864, and in its native home, the Rocky Mountains, feeds naturally upon another wild species of potato, which is quite distinct from the horse-nettle, and is peculiar to the Rocky Mountain region. Again, the former species has never yet been known to attack the cultivated potato, and in all likelihood never will do so; for, as it has existed in Illinois for at least fourteen years and in Georgia for at least forty-four years, without ever having been known to attack this plant, which has been growing all that time in these two states, it is not at all probable that it will do so at any future time. The latter species, on the other hand, acquired this habit, as was shown before, in the region of the Rocky Mountains, when, for the first time the potato was introduced there, some twenty years ago; and from that region the potato-feeding race of this insect has since been spreading further and further every year towards the east. Finally the bogus Colorado potato bug is more peculiarly a southern species, occurring in the more southerly portion of Illinois, and in Missouri, Kentucky, Georgia, and probably Alabama, while the true Colorado potato

bug is originally an Alpine species, its native home being the canons (kanyons) of the Rocky Mountains, and it therefore thrives best and spreads fastest in the more northerly regions, such as Nebraska, Iowa, Minnesota, Wisconsin and North Illinois; while in south Illinois, Missouri and Kansas it neither thrives so well nor spreads so rapidly.

The question whether the true Colorado potato bug has existed for an indefinitely long time in the country that lies to the east of the Mississippi river, or whether it is not the bogus Colorado potato bug that has there been mistaken for it, while the true Colorado bug has in reality emigrated into that country from the Rocky Mountain region within the last four or five years, may seem to some of merely theoretical interest. It is, however, of great importance. On the first supposition it is not probable that this bitter enemy of the potato will travel onwards towards the Atlantic; on the second supposition it will most likely invade Ohio within a year or two, spread like a devouring flame through the great potato-growing state of Michigan, and finally pass eastwards into Pennsylvania, New York, and New England. We make no apology, therefore, to our readers for presenting them with the complete history of these two insects, copiously illustrated by figures, and for pointing out the minute but invariable character which distinguish them, both in the larva and in the perfect state. This is the first time that the larva of the bogus Colorado potato bug has ever been figured and scientifically described.

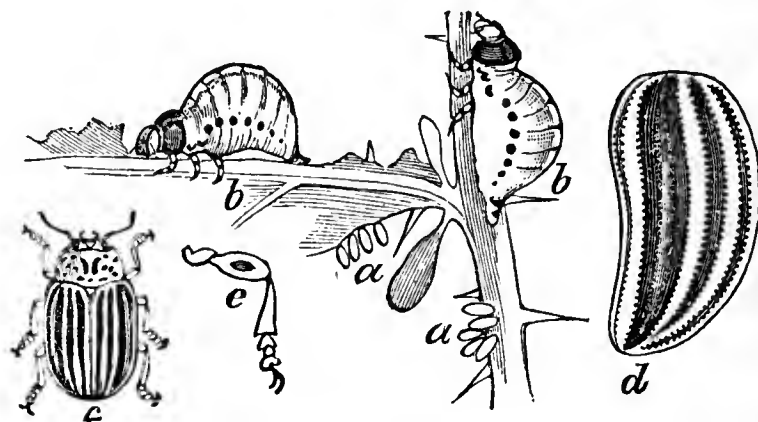
THE TRUE AND THE BOGUS COLORADO POTATO BUG.

Figure 44 *b, b, b*, gives a view of the larva of the true Colorado potato bug, in various positions and stages of its existence; Figure 45 *b, b*, of that of the bogus Colorado potato bug. It will be seen at once that the head of the former is black, that the first joint behind the head is pale edged with black behind only, that there is a double row of black spots along the side of the body, and that the legs are black. In the other larva (Fig. 45 *b*.) on the contrary, the

head is of a pale color, the first joint behind the head is tinged with dusky and edged all round with black, there is but a single row of black spots along the side of the body, and the legs are pale. Take a hundred full-grown specimens of the former larva, and you will find them all to present the above characters. Take a hundred full-grown specimens of the latter larva, and precisely the same rule will hold good.

Now let us see what are the differences in the perfect beetle state of these two insects, in which state even a practiced entomologist would, at first sight, be apt to confound them

Fig. 45.



Colors—(a) between cream and flesh colors; (b) flesh color; (c and d) cream color, black and brown.

together. Indeed, so minute are the differences, that in a drawing of the natural size it is scarcely possible to exhibit them, and in order to do so we have been compelled to greatly magnify the wing-cases and the leg of each species. Figure 44 *d, d*, exhibits the true Colorado potato bug; Fig. 45 *c* the bogus Colorado potato bug, each of its natural size. Fig. 44 *e* shows the *left* wing-case enlarged, and Fig. 44 *f* an enlarged leg of the former; Fig. 44 *d* the *left* wing case enlarged, and Fig. 45 *e* an enlarged leg of the latter. On close inspection it will be perceived that in the former (Fig. 44 *e*) the boundary of each dark stripe on the wing-cases, especially towards the middle, is studded with confused and irregular punctures, partly inside and partly outside the edge of the dark stripe; that it is the third and fourth dark stripes, counting from the outside, that are united behind; and that in the leg both the knees and the feet are black. In the latter (Fig. 45 *d*), on the

contrary, the dark stripes are accurately edged by a single regular row of punctures placed in a groove (*stria*;) it is the second and third stripes—not the third and fourth—counting from the outside, that are united behind, the space between them being almost always brown; and the leg is entirely pale, except a black spot on the middle of the front of the thigh.

The spots on the thorax, in either of the above two species, are normally eighteen in number, arranged in the same very peculiar pattern which may be seen both in Fig. 44 *d*, *d*, and in Fig. 45 *c*; and precisely the same variations in this complicated pattern occur in either species. These are certainly very remarkable and suggestive facts.

After all these statements, it will not be wondered at that several otherwise well qualified observers have imagined that they had captured the true Colorado potato bug in Illinois long previously to the year 1864. Many such cases have been carefully investigated, and in every one of them it has turned out, upon examining the specimens, that the supposed true Colorado potato bugs simply belonged to the bogus species. Hence it is but reasonable to infer that in other cases, where it was not practicable to examine the specimens, the same very natural error had been inadvertently committed.

HABITS OF THE COLORADO POTATO BUG.

The Colorado potato bug, though it has acquired a prescriptive title to the appellation of “bug,” is not, entomologically speaking, a bug (order *Heteroptera*,) but a beetle (order *Coleoptera*,) It might, perhaps, be desirable, if it were possible, to get people to call it a “potato-beetle;” but as long as we all of us continue to talk every day of “shipping” goods by a railroad car, as well as by a ship, and as long as everybody, including the almanac-makers, writes about “sunrise” and “sunset,” while in reality it is the earth, and not the sun, that rises and sets every day, we must be content to smother our partiality for entomological purism, and talk with the vulgar, though we think with the wise.

The wings of this insect, like those of several allied species, are of a bright rose-color, and with its cream-colored body, and the five black stripes upon each wing-case, it presents a beautiful appearance as it flies abroad in the clear light of the sun. The junior editor of this paper was the first person in the United States to breed this species from the egg to the beetle state, and to ascertain that it required less than a month to pass through all its changes. In the *Prairie Farmer* for August 8, 1863, will be found the full account, by this writer, of the whole process, illustrated by a figure of the larvæ. Subsequently, in 1866, Dr. Shimer added some very interesting particulars bearing upon this subject, in a paper which he published in the *Practical Entomologist*. There are about three broods of larvæ every year in north Illinois and central Missouri, each of which goes underground to pass into the pupa state, the two first broods coming out of the ground in the beetle state about ten or twelve days afterwards, while the last one stays underground all winter, and only emerges in the beetle state in the following spring, just in time to lay its eggs upon the young potato leaves. The eggs, it may be added, are of a yellow color, and are always laid upon the under side of the leaves in patches of 20 or 30. At Fig. 44 *a, a*, the eggs are shown, and at Fig. 45 *a, a*, those of the bogus Colorado potato bug, which are of a lighter color, are also shown, all of the natural size.

Unlike many other noxious insects, this larvæ is not a general feeder, but is confined to plants belonging to the potato family (*Solanaceæ*), and especially the genus to which the potato belongs (*Solanum*.) Occasionally it feeds on the tomato, and a few specimens have been noticed by us on the ground-cherry (*Physalis*), and on the imported Jamestown-weed, or gympson-weed (*Datura*.) According to Mr. Terry of Iowa, it also occurred in that state, several years ago, on the horse-nettle (*Solanum*), upon which plant we have ourselves noticed it in great numbers in Missouri; and it is certainly far more destructive to the egg-plant than even to the potato. Now, the

egg-plant, the horse-nettle, and the potato, all three of them belong to the same genus (*Solanum*,) as the wild plant upon which the larvæ originally fed in the Rocky Mountain region ; but the egg-plant and the horse-nettle are botanically more closely related to the last than is the potato ; being, like the Rocky Mountain potato, covered with thorny prickles, while the cultivated potato is perfectly smooth. On the other hand, the cultivated potato is much more nearly related to the Rocky Mountain species than is the tomato ; which last has, by modern botanists, been removed from the genus to which the other two appertain, and placed in a genus by itself. It would, seem, therefore, that the closer a plant comes to the natural food-plant of the insect, the better the insect likes it.

It is undoubtedly a most singular and note-worthy fact that, out of two such very closely allied species as the bogus and true Colorado potato bugs, feeding respectively in the first instance upon very closely allied species of wild potato (*Solanum rostratum* and *S. Carolinense*,) the former should have pertinaciously refused, for about half a century, to acquire a taste for the cultivated potato, with which it was all the time in the closest and most immediate contact, while the latter acquired that taste as soon as ever it was brought into contact with the plant. But, after all, this is not so anomalous and inexplicable as the fact that the apple-maggot fly (*Trydeta pomonella*), Walsh,) which exists both in Illinois, New York, and New England, and the larvæ of which feeds in Illinois upon the native haws, and has never once been noticed to attack the imported apple there, should, within the last five years, have suddenly fallen upon the apple, both in New York and New England, and in many localities there have become a more grievous foe to that fruit than even the imported apple-worm. (*Carpocapsa pomonella*, Linn.) Thinking that it might be possible that, although the bogus Colorado potato bug has for about a half century refused to feed upon the potato in a state of nature, it might be compelled by starvation to feed upon that plant in a state of confinement, we placed two of the

larvæ received from Mrs. Freeman in a vessel along with some potato leaves ; but, instead of feeding voraciously upon them, as the larvæ of the true potato bug would certainly have done, they only nibbled a few small holes in them about the size of a pin's head, and then in a week's time died of starvation. This, however can scarcely be quoted as a decisive experiment, because these larvae had fasted for about a day before they reached us, owing to the leaves in which they were packed having dried up ; and because no vegetable-feeding animals can stand long fasting as well as flesh-feeding animals do. But even if they had actually feed upon the potato leaves quite freely in a state of confinement, it by no means follows that the mother beetle would deposit her eggs upon the potato in a state of nature, and thereby compel her future progeny to feed upon that plant. That she will do so upon her natural food-plant, the horse nettle, we know ; and, according to Mr. Walter, of Alabama, she will also upon the egg-plant, which is thorny like the horse-nettle. But apparently she is naturally indisposed to go one step further, and lay her eggs upon a smooth species of the same botanical genus, namely, the potato.

We have experimentally ascertained that neither ducks, geese, turkeys nor barn-door fowls will touch the larvæ of the Colorado bug when it is offered to them ; and there are numerous authentic cases on record where persons who have scalded to death quantities of these larvae, and inhaled the fumes from their bodies, have been taken seriously ill, and even been confined to their beds for many days in consequence. Still, these larvae are not near so poisonous as the old fashioned Blister-beetles already referred to as infesting the potato ; for these last are, even in small doses, one of the most powerful medicines, and therefore in larger quantities one of the most virulent poisons known to the medical profession.

FOES OF THE COLORADO POTATO BUG.

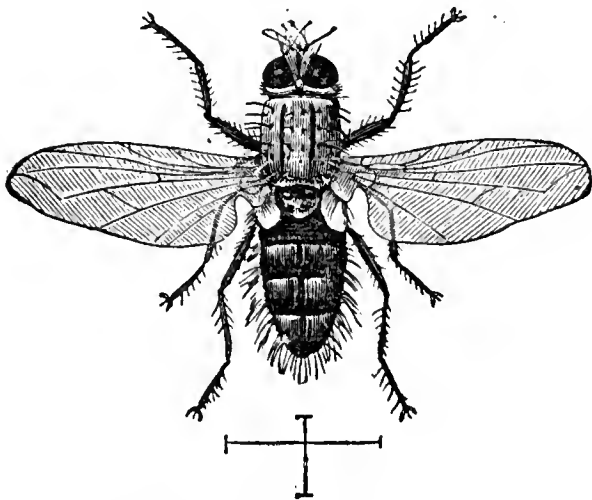
Persons not familiar with the economy of insects are continually broaching the idea that, because the Colorado potato

bug is in certain seasons comparatively quite scarce, therefore it is about to disappear and trouble them no more. This is a very fallacious mode of reasoning. There are many insects—for instance, the notorious Army-worm of the North (*Leucania unipuncta*, Haworth)—which only appear in noticeable numbers in particular years, though there are enough of them left over from the crop of every year to keep up the breed for the succeeding year. There are other insects—for instance, the Cankerworm (*Anisopteryx vernata*, Peck)—which ordinarily occur in about the same numbers for a series of years, and then, in a particular season and in a particular locality, seem to be all at once swept from off the face of the earth. These phenomena are due to several different causes, but principally to the variation and irregularity in the action of cannibal and parasitic insects. We are apt to forget that the system of Nature is a very complicated one—parasite preying upon parasite, cannibal upon cannibal, parasite upon cannibal, and cannibal upon parasite—till there are often so many links in the chain that an occasional irregularity becomes almost inevitable. Every collector of insects knows that scarcely a single season elapses in which several insects, that are ordinarily quite rare, are not met with in prodigious abundance; and this remark applies, not only to the plant-feeding species, but also to the cannibals and parasites. Now, it must be quite evident that if, in a particular season, the enemies of a particular plant-feeder are unusually abundant the plant-feeder will be greatly diminished in numbers, and will not be able to expand to its ordinary proportions until the check that has hitherto controlled it is weakened in force. The same rule will hold with the enemies that prey upon the plant-feeder, and also with the enemies that prey upon those enemies, and so on *ad infinitum*. The real wonder is, not that there should be occasional irregularities in the numbers of particular species of insects from year to year, but that upon the whole the scheme of creation should be so admirably dove-tailed and fitted together, that tens of thousands of distinct species of

animals and plants are able permanently to hold their ground, year after year, upon a tract of land no larger than an ordinary state.

To afford some practical idea of the number of enemies that often prey upon a single insect, we will now give a brief account, illustrated by figures, of a few of the various cannibal

Fig. 46.



Colors—Gray, black and silvery white.

insects that attack the Colorado potato bug, either in the egg, larva or perfect state. The list might be easily swelled to over a score, but to avoid entering upon a multiplicity of details we shall enumerate only ten distinct species. Hitherto it has been supposed that there was no parasitic insect whatever that preyed internally up-

on the larvæ of this potato bug; but we have ourselves bred from these larvæ a parasitic two-winged fly (*Tachina* family, Fig. 46,) the peculiar habit of which is to attach its egg externally to the body of its living victim; which egg subsequently hatches out, burrows into the body of the infested

Fig. 47.



Colors—Pink and black.

Fig. 48.



Colors—Brick red, black and white.

Fig. 49.



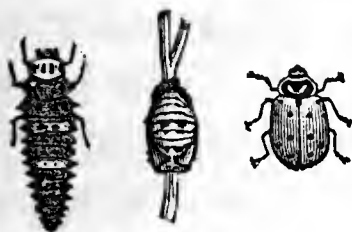
Colors—Brick red, black and white.

larva, and eventually destroys it, but not until it has gone under ground in the usual manner. The important and extensive family to which this two-winged fly belongs has hitherto been so little attended to by North American Entomologists, that we cannot satisfactorily identify it with any of the few prescribed species, and for the same reason we prefer not to name and describe it as a new species.

In the egg state the Colorado potato bug is preyed upon by no

less than four distinct species of Ladybird—the spotted Ladybird (*Hippodamia maculata*, DeGeer, Fig. 47.) the nine-marked Ladybird (*Coccinella 9-notata*, Herbst, Fig. 48,) the thirteen-dotted Ladybird (*Hippodamia 13-punctata*, Linn., Fig. 49,) and the convergent Ladybird (*Hippodamia convergens*, Guer.) This last

Fig. 50.

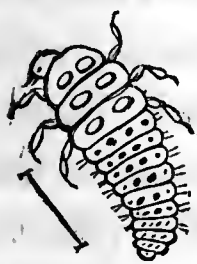


Colors—(a) blue, orange and black; (b) venetian red and black; (c) orange red, black and white.

species, the three stages of which are represented of the natural size, in Fig. 50, (a the larva, b the pupa, and c the beetle,) is rather a rare insect in north Illinois, though it is common enough in south Illinois and Missouri. Its pupa (Fig. 50 b,) which is attached to the leaves of the plant upon which the larva has lived, might be readily

mistaken for that of the potato bug larva. The larvæ of all these Ladybirds are far more blood-thirsty in their habits than the perfect beetles; and as they all have a strong resemblance, Figs. 50 a and 51 will give a sufficient good idea of them all.

Fig. 51.



Colors—Black and orange.

They run with considerable speed, and may be found in great numbers upon almost all kinds of herbage. The larvæ of certain species that prey upon the Hop Plant-louse in the east are well known to the hop-pickers as “black niggers” or “serpents,” and are carefully preserved by them as some of their most efficient friends.

The eggs of Ladybirds greatly resemble those of the Colorado potato bug, and are scarcely distinguishable except by their smaller size and by a much smaller number being usually collected together in a single group. As these eggs are often laid in the same situation as those of the potato-feeding insect, care must be taken by persons who undertake to destroy the latter, not to confound those of their best friends with those of their bitterest enemies.

In the larva state the Colorado potato bug is extensively depredated on, both in Illinois, Missouri and Iowa, by the spined soldier-bug (*Arma spinosa*, Dallas, Fig. 52 b.) Thrusting forwards his long and stout beak, he sticks it into his victim, and

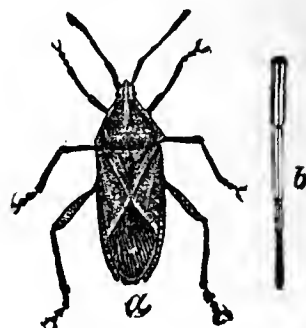
in a short time pumps out all the juices of its body and throws away the empty skin. He belongs to a rather extensive group (*Scutellera* family) of the true bugs (*Heteroptera*,) distinguishable from all others by the very large scutel, which in this genus is triangular, and covers nearly half his back. Most of the genera belonging to this group are plant-feeders, but there is a sub-group (*Spissirostres*) to which our cannibal friend belongs, characterized by the robustness of their beaks, and all of these, so far as our experience extends, are cannibals. To illustrate to the eye the difference between the beaks of the

Fig. 52.



Colors—Dull olive with yellow markings.

Fig. 53.



Colors—Sober brown and speckled with ochre and yellow.

cannibal sub-group and the plant-feeding sub-groups of this family, Fig. 52 *a* gives a magnified view of the beak of our insect seen from below, and Fig. 52 *c* a similarly magnified view of that of a plant-feeder belonging to the same family (*Euschistus punctipes*, Say,) which is so nearly of the same size, shape and color as our cannibal friend, that at first many persons would mistake one for the other. The spined-bug, however, may be at once distinguished from all allied bugs, whether plant-feeders or cannibals, by the opaque brown streak at the transparent and glassy tip of its wing-cases.

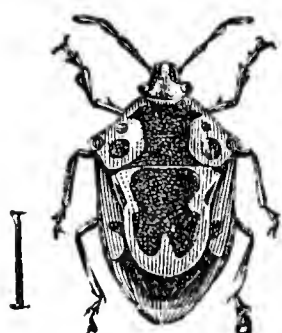
Two years ago we were informed by our ornithological friend, Dr. Velie, that a good observer in Henry county, Ill., discovered that the large brown squash-bug (*Coreus tristis*, De-Geer,) depredated extensively upon the larvæ of the Colorado potato bug. We said at the time that this must be a mistake, because not a single species of this group (*Coreus* family) is known to be cannibal. We can now understand how this mistake arose. No less than five persons in south Illinois, to whom

we showed a specimen of the spined soldier-bug, said at once: "Why, that is nothing but a squash-bug." And yet in the eyes of an entomologist the squash-bug looks as different from the spined soldier-bug as a cow does from a horse! That our readers may see the wide difference between the two insects, we give by the side of the wood cut of the spined soldier-bug (Fig. 52 *b*) a correct drawing of the squash-bug (Fig. 53 *a*) and its beak (Fig. 53 *b*).

The Spined Soldier-bug by no means preys exclusively upon potato bugs. We have caught him in the spring of the year sucking the juices of a wild bee (*Andrena*) half an inch long, and carefully holding it out at arm's length all the time, so as to avoid its sting. He also attacks the green larvæ of the native American Gooseberry Saw-fly (*Pristiphora grossulariæ*, Walsh,) as we learn from a very good observer, Miss Marian Hobart, of Port Byron, Ill. And both Dr. Hull and Mr. Jonathan Huggins saw the little hero with his beak plunged into the body of a full sized Locust (*Cicada*), and draining away its life-blood in spite of all its kickings and strugglings. We are sorry, however, to be obliged to confess that in Mr. Riehl's potato field, near Alton, a single individual was seen in June, 1868, bayoneting a poor Nine-marked Ladybird (Fig. 48) with his blood-thirsty beak. Perhaps, however, he was, under the circumstances, excusable; for he and his comrades had almost completely cleared the potatoes of the Colorado gentlemen, and he probably concluded that the services of the Ladybird were no longer required there. The Spined Soldier-bug is very common everywhere in Illinois, Iowa and Missouri, but occurs more frequently on the trees than on herbaceous plants. We caught eight or nine of them in about half an hour off Dr. Hull's fruit trees with his Curculio catcher. Another species of the same genus (*Arma*, near *modesta*, Dallas) inhabits, in the larva and pupa states, the nests of the Fall Web-worm (*Hyphantria textor*, Harris,) and slaughters the defenceless inhabitants without mercy. We have bred it from the larva to the perfect state, feeding it upon caterpillars.

Another true bug, that has been repeatedly seen by Mr.

Fig. 54,



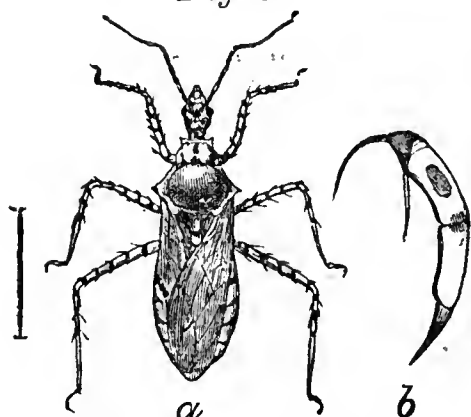
Colors—Dark bottle-green and cream-color.

Riehl, of Alton, preying upon the Colorado larva, is the Bordered Soldier-bug (*Stiretrus fimbriatus*, Say, Fig. 54.) Unlike the Spined Soldier-bug, this species is so conspicuously and prettily marked that it cannot easily be confounded with any other. We once met with seven or eight individuals in the web-nest of a small social caterpillar; and we have seen it more than once with its beak

immersed in the body of the larva of the *Asterias* butterfly. It belongs to the same sub-group, and has the same short, robust beak, as the Spined Soldier-bug; but, unlike that species, it is by no means common.

Another true bug, still more elegantly marked than the

Fig. 55.



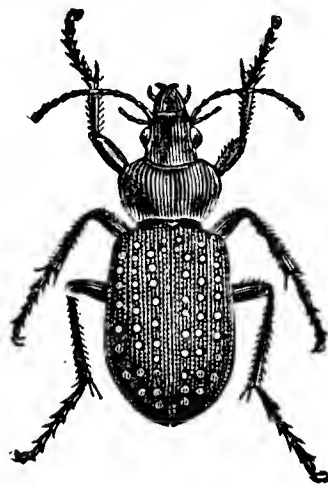
preceding, the Many-banded Robber (*Harpactor cinctus*, Fabr., Fig. 55 a,) was observed by Dr. Shimer, of Mt. Carroll, Ill., to attack the Colorado larvæ and we ourselves found it attacking the same larva in Missouri the same year. Like the Spined-bug, this species is common, and inhabits trees more commonly than herbaceous plants. But it belong to an entirely different group of the true bugs (*Reduviu*s family) all of which, without exception, are cannibals, and are characterized by a very short, robust, curved beak (Fig. 55 b,) profile view, magnified. We have noticed this species to prey upon a great variety of different insects.

The above three insects are all of them true bugs, and attack the larvæ of the Colorado potato bug with the only offensive weapon that they have—their beak. The four following (Figs. 56 to 59) are all beetles, and are consequently provided with jaws, so that they are able to eat up their victims bodily; and all of them, except the first which is confined to

southerly latitudes, are common throughout the western states. Most, if not all of them, prey indifferently upon the Colorado larvæ and the perfect insect produced from it; but, as this article has already been extended to an undue length, we shall not dilate upon the habits of each of them, but shall content ourselves with giving figures, by which they may for the future be recognized without much difficulty. There are ten or

Fig. 56.

Colors—Dark metallic green with brown legs.

Fig. 57.

Colors—Black, with coppery dots.

Fig. 58.

Colors—Black, edged with blue.

Fig. 59.

Color—Dull black

twelve other beetles, mostly of small size, which have the same habits as the above; but, as they would not be readily identified from an uncolored drawing, we omit them for the present.

In many parts of the west the potato beetle is being kept in due check by its cannibal and parasitic enemies, which are still increasing. Thus we learn from many sources that in Iowa and Kansas it is not nearly so injurious as it formerly was, while in some parts of Illinois and Missouri it has also

become less troublesome. In 1869 Mr. T. Glover published the fact that the Great Lebia (*Lebia grandis*, Hentz,) was found devouring its larvæ, and though hitherto considered rare this Lebia has suddenly fallen upon it the present year in many parts of Missouri. During a recent trip along the Missouri bottom we found this cannibal very abundant in some potato fields belonging to Mr. Wm. Coleman, where it was actively engaged in destroying both the eggs and larvæ of the potato beetles. The head, thorax and legs of this cannibal are yellowish-brown, in high contrast with its dark-blue wing-covers.

This makes fourteen conspicuous enemies of our Colorado potato beetle which we have figured, and a dozen more, mostly of small size and inconspicuous markings, might easily be added to the list. Moreover, chickens have learned to relish the eggs, and have even acquired a taste for the young larvæ.

REMEDIES AGAINST THE COLORADO POTATO BUG.

It only remains to say something on the most approved methods of fighting the Colorado potato bug. A great deal may be effected by raising your potatoes at a point as remote as possible from any ground where potatoes were raised in the preceding year. A great deal may also be accomplished, where there are no other potato patches in the immediate neighborhood, by killing every bug found upon the vines in the spring as fast as they emerge from the ground. By this means the evil is nipped in the bud, and a pretty effectual stop is put to the further propagation of the insect. But if there are potato patches near by, where no attention is paid to destroying the bugs, the bugs will keep perpetually flying in upon you in spite of all you can do. In such a case the old remedy was hand-picking and shaking the vines into a pan. It costs much less to dust the vines over, when the dew is on them, with White Hellebore powder, which Mr. Graham Lee, of Mercer county, Ill., found to be an effectual remedy, and not to cost over \$2 or \$3 per acre. This is the article which is sold all over the country under various names, as "Potato-bug Poison," etc. Care, however, should be taken in

using it not to allow any of it to get into the eyes or nose, as it is a virulent poison. Perhaps as good a mode as any, where the bugs have not been permitted to get too great a start on the vines, would be to introduce among them a number of the spined-soldier-bug described and figured above (Fig. 52.) By beating forest trees into an inverted umbrella, large numbers of these cannibal bugs may be obtained in a short time, and temporarily deposited in any convenient vessel, along with a quantity of leaves, to prevent them from fighting and destroying one another. It must be recollected, however, that many plant-feeding bugs, very much resembling our soldier friend, occur on trees along with him, and that, unless care is taken to discriminate between your friends and your foes, your experience may be as unfortunate as that of the London cockney who bought a wolf instead of a sheep dog to take care of his sheep.

Paris green has now become the remedy, and is the best yet discovered. Having thoroughly tested it ourselves, and having seen it extensively used, we can freely say that, when applied judiciously, it is efficient and harmless. If used pure and too abundantly, it will kill the vines as effectually as would the bugs, for it is nothing but arsenite of copper (often called "Scheele's green" by druggists), and contains a varied proportion of arsenious acid, according to its quality—often as much as fifty-nine per cent. according to Brande & Taylor. But when used with six to twelve parts, either of flour, ashes, plaster or slacked lime, it causes no serious injury to the foliage, and just as effectually kills the bugs. The varied success attending its use, as reported through our many agricultural papers, must be attributed to the difference in the quality of the drug.

We hear many fears expressed that this poison may be washed into the soil, absorbed by the rootlets, and thus poison the tubers; but persons who entertain such fears forget that they themselves often apply to the ground, as nourishment for the vines, either animal, vegetable or mineral substances that are nauseous, or even poisonous to us. Animal and even veg-

etable substances, of whatsoever nature, must be essentially changed in character and rendered harmless before they can be converted into healthy tubers, and a mineral poison could only do harm by being taken with the potatoes to the table. That any substance, sprinkled either on the vines or on the ground, would ever accompany to the table a vegetable which develops underground, and which is always well cooked before use, is rendered highly improbable. There can be no danger in the use of sound tubers. But the wise and well-informed cultivator will seldom need to have recourse to Paris green, as he will find it more profitable to use the different preventative measures that have from time to time been recommended in these columns.

The poison may do harm, however, by being carelessly used, and it is most safely applied when attached to the end of a stick several feet long, and should not be used where children are likely to play.

The true remedy consists in preventing them from becoming numerous so late in the season. Watch for the beetles in early spring, when the vines are just peeping out of the ground. Ensnare as many of them as you can before they get a chance to pair, by making a few small heaps of potatoes in the field planted; to these the beetles will be attracted for food, and you can easily kill them in the morning. Keep an eagle eye for the eggs which are first deposited. Cultivate well, by frequently stirring the soil. Plant early varieties in preference to late ones because the bugs are always more numerous late in the season than they are during the spring and early summer. Give the preference to the Peach Blow, Early Rose and such other varieties as have been found most exempt from attack, and surround your fields on the outside by rows of such tender-leaved varieties as the Mercer, Shaker, Russet, Pink-eye and Early Goodrich; but, above all, isolate your potato field as much as possible, either by using land surrounded by timber, or by planting in the center of a cornfield. Carry out these suggestions thoroughly and you will not have much use for Paris green, and still less for the scorching remedy.

CULTIVATION OF CORN.

BY J. C. STARKWEATHER, OCONOMOWOC.

The farming community, as a class, are very slow to make any change in their methods of cultivating the soil. In all the details of farming, from planting the seed to harvesting the crop, they cling tenaciously to the habits and customs of their fathers and grandfathers, as being the good old way—the one in which they should travel all their lives long. A large portion of them have their favorite crops, which they must raise, and no other; any new and improved varieties of these kinds they usually regard as humbugs and innovations.

This state of things ought not so to be. In an age of progress, farmers should not alone stand still. Their own interests, and the public welfare, demand that they too should improve upon old methods. To do this, they should not only encourage those who are endeavouring to introduce better systems of cultivation, and to improve the quality and increase the amount of the products of our labor, but they should by direct efforts and individual experiments seek to attain the same end. The man who in any way lessens the amount of labor necessary to raise a given crop, or who by a better system of tillage, by the selection of better seed, or by originating new varieties improves the quality, or increases the productiveness of our crops is a public benefactor; he adds to the wealth and prosperity of the whole community. The benefit may seem small and of little value in the individual item, the acre or bushel, but when applied to the whole country, to millions of farmers, acres and bushels, the aggregate value is seen to be of great importance.

Take the corn crop of our country, of which I wish to speak—as it is the most important of all our cereal productions, both in the number of acres cultivated, number of bushels

raised, and in aggregate value of product—how much would be added to its value by even a small improvement in quality or quantity per acre?

The following facts and figures will show the importance of the subject, and should lead us, both, to avail ourselves of the improvements made by others, and to make greater personal efforts to much better cultivation and increased production.

The total value of all cereals in 1869, as reported by the Agricultural Department, including cotton, tobacco and hay, was \$1,849,179,843; being one-tenth part of the value of the real estate of the country. The value of the corn crop was \$658,582,700; hay \$337,662,600; cotton \$303,600,000; wheat \$247,099,120; oats \$137,347,000. The relative value of yield per acre, as governed and controlled by the prevailing prices of the year, are in the following order: Tobacco, potatoes, cotton, barley, hay, corn, buckwheat, oats, rye and wheat. Vermont has the greatest average value of corn; and New Hampshire the greatest average value of wheat; Kansas has the largest yield of corn to the acre, being 48.4 bushels; and Georgia the smallest, 21 bushels. Oregon had the largest yield of wheat to the acre, 19 bushels; and South Carolina the smallest, 6.6 bushels. From these statements, it appears that the corn crop stands first in aggregate valuation and yield, and wheat next to the last; deducting the largest average yield of wheat from the largest average yield of corn, there remains a difference of 29.4 bushels in favor of the corn crop. In comparing these relative statistics year after year, the same, and even a greater difference will be found in favor of corn over wheat. This leads us to inquire, what is the best plan for us to pursue, whereby we may increase the yield of corn, the golden crop of the world.

The varieties of corn are numerous, of all colors and descriptions, large and small, eight, ten and twelve rowed. Every variety of soil and climate has some kind more or less adapted to its peculiarities. Of these many kinds it is only by actual trial that we can learn what varieties are best adapted to our

own conditions of soil and climate; for varieties that are valuable for cultivation in some localities are nearly worthless in others. After selecting the variety to be raised, and ascertaining from trial that the seed will germinate, we must plant at the right time and in the best manner, cultivate thoroughly, and harvest properly in order to secure the greatest amount of profit from our labor and expenditures.

In my experience I find that for a good crop of corn the land, especially sod ground, should be plowed in the fall, instead of the spring, as is usually the custom. This leaves the ground in much better condition for the crop; it works and pulverizes better; the sod is more decomposed, having had full action of the frosts, sun and rains, and is better fitted to furnish food to the growing plants. It destroys the cut, and other worms, so damaging to the growing crop. After plowing the land, haul on the manure, and spread it from the cart, or wagon as hauled out. It makes no difference if taken out and spread upon the snow in the winter, the spring rains will so act upon it as to carry the chief strength into the soil, and when cultivated and dragged in the spring before planting, that which is left will become thoroughly incorporated in the soil. It is a well settled fact, based upon experiments, that manure spread in this way, is of more value than in any other, and besides, it is done at a less expenditure of time and labor, and has the additional advantage of securing the destruction of all the foul seeds it may contain.

There is great differences of opinion as to the proper depth for plowing corn land, some maintaining that 10 inches or more is preferable; others give the preference to shallow plowing, not to exceed 4 or 6 inches. Both courses are sustained by experiments, which prove as much in the one case, as the other. Farmers must determine by their own individual experiments which is the best adapted to their lands; for different soils require different courses to be pursued in this respect. I find my land doing the best, when plowed about six inches in depth.

After the land has been thoroughly cultivated, and pulverized, making a perfect garden bed of it, then roll it, and mark it off into squares, with a two horse corn marker, that will mark four rows at a time. Make the rows four feet apart each way for the large stalked varieties; three or three and one half feet will do for the smaller varieties, where the soil is good, and in proper condition—plant with the hoe, having enough help to finish the field to be planted in at least three days time. Plant as early, as the ground is fit. I am satisfied that we put off our planting later in the season than is advisable; the result rather of press of work in the spring than the fear of spring frosts. Corn should be planted early enough to escape the frosts of fall; allowing about one hundred and thirty days from the time of planting to the time of its maturity.

Soak the corn for twenty-four hours in water, then roll it, or sprinkle it thoroughly, with land plaster. In planting, put only four kernels in a hill. In heavy clay soil, if early in the spring, plant near the surface of the ground, and do not cover it so deep, that it will be out of the reach of the warmth of the sun. Do not step on it, or pound the ground down with the hoe, after planting. When near the surface, the spring rains will keep it moist, and the heat of the sun will cause it sooner to sprout, and grow. If planted late in the season, it must be planted deeper in the soil, in order to obtain the moisture so necessary to its growth; for then the rain comes less frequently, and the top of the ground becomes hard and baked, and corn planted near the surface, may remain for weeks dry, without sprouting, and in some cases, where it does sprout, for want of moisture it soon withers up and dies, and the field has to be replanted. Witness the season of 1870, as a fair and complete exposition of the truth of this theory.

After the corn makes its appearance, start the cultivators, and keep them at work almost constantly until the stalks have become so tall and thick, that a horse cannot pass through the rows without injury to the growing crop. The more cultivation, the more corn. Pumpkins, and sometimes squash, are

planted with corn, and it is supposed do not detract much from the growth or yield of the crop; but one thing is certain, if they do no injury in this respect, the vines do interfere with the full and complete cultivation of the land; and it seems to me, that whatever nourishment is necessary to grow the pumpkin, is taken from the soil, and it necessarily must take away from the corn so much strength required for its support. It is a good plan to plant two or three rows of potatoes upon the four sides of the corn field, planting the hills in line with the rows of corn, as it saves considerable destruction of the crop by the horse and cultivator when turning about. When the stalks are of sufficient height, the hills should be thoroughly examined, and only three stalks of the larger varieties, and not more than four of the smaller varieties be allowed to mature. The crop will be larger and better for the trouble taken in this respect. The "Sandford," and many other kinds of corn sends forth small shoots or suckers, to a very great extent, and many farmers are in the habit of pulling, or breaking them off, believing that they hinder the corn from maturing early, as well as lessen the amount grown. In the year 1869, I selected two and a half acres, from which I took off the suckers, and compared them with the adjoining two and a half acres in the same field, upon which the suckers were allowed to grow. Both were manured, planted, cultivated and handled alike, and upon actual measurement of the yield of corn, the difference was greatly in favor of the field in which the suckers were allowed to grow. It had the most corn, the most fodder, and there was no perceptible difference as to the number of nubbins. Of twenty farmers advising, half said let the suckers grow, and the other half said, take them off; a fair exhibition of how little we know about farming.

When the corn has reached the glazing point, the field should be examined from time to time, and the best, most mature ears selected for seed, plaited together and hung away in some safe and dry place to become thoroughly hardened. The best ears should also be selected when husked, as in a large field many

choice ears will be overlooked. In this way, by exercising ordinary care, we may secure more perfect and compact ears and an earlier ripening of our corn crop, perhaps bringing it to maturity within one hundred days, and thus escape all fears of frost in the fall.

There is much difference of opinion, as to whether it is better to hill up corn, or to leave it for close, level cultivation, passing the cultivator as near as possible without injury to the roots; from experiments made I conclude, that with the Dent varieties it is better to use the hoe, and hill up considerable after the third cultivation, but with the smaller varieties, it is of no use whatever, an injury, rather than a benefit. When the corn is sufficiently matured, before the stalks begin to wither, it should be cut up, and placed in shocks for the final curing. I would secure all varieties, excepting the Dent, in this way. The Dent I would top for fodder, leaving the corn upon the stalks standing in the field; when ready to gather, drive in your teams, pick the corn with the husks on and crib it. Husking is a mere waste of time and money; it will keep and feed out, husks and all, just as well if not better; animals will be obliged to consume more time in getting at the corn, and consequently, it will be more slowly and better masticated. When the crop is gathered, turn in your cattle to consume what is left, taking particular care however, that they begin gradually, and have plenty of water and other food, until they become accustomed to the fodder. In this way nearly all will be consumed, without any danger to the stock from smut.

In the spring, before the frost has left the ground, hitch your team to a stick of timber, of sufficient length to cover three rows of stalks, and of sufficient weight to break them down; then drive around the field as you intend to plow, and the stalks will be carried to the ground, and easily plowed under. In this way corn can follow corn, with profit to itself, and benefit to the land; for a large portion is returned as manure to the soil from which the crop was taken.

Other varieties of corn, should be cut up, and placed in

shocks for curing, and when sufficiently dried, it can either be hauled into the barn for husking in the winter, without loss of stalks or corn—leaving the land ready for fall plowing—or it can be husked in the field, the corn cribbed, and the stalks put in the barn, or in small stacks for feeding purposes.

Corn, as a crop, has no wastage; the grain, the stalk, the cob, every part of it, can be used as food. Cattle, horses, sheep, hogs, in fact all animals, can be fed and fattened on it. Man himself enjoys and appreciates it. It costs less to raise than other grain. There is more profit in it. It leaves the land in splendid condition for all other crops, and exhausts it less. Taken all in all, it is *the* crop for the farmer to raise.

"THE COMING HOG."

BY M. K. YOUNG, GLEN HAVEN.

If anything is characteristic of the public sentiment of the American people, it is its proneness to yield to the rage of the hour, and then dash off into some other extreme, rut or groove, to be given up in its turn to a third furor, no less distinctive and peculiar. This is not only true on subjects involving feeling or the adjustments of a logical relationship merely, but equally true of such as embrace the gravest considerations of physical and organic law. Nor is this peculiarity confined to the more uneasy and impulsive circles of society—those of fashion, adventure and commerce. It is found in all the industries, including the more staid and considerate manifestations of the agricultural mind.

A more detailed allusion to this is foreign to our purpose, but one more especially connected with our subject is within the record of the "whole hog" for the last fifty years. The China, Neopolitan, Berkshire, Bedford, Woburn, Byfield, Russia, Grazer, Essex, Suffolk, Chester, Cheshire, Magie (or many-named), have each had, or are having their day and laudations from their friends and admirers, and the great pork public, as the perfect embodiments of swinish achievement. In point of fact all these breeds have their special merits as connected with locality and purposes of production, modified by climate and markets, and in like manner none of them are free from demerit. The idea of a given breed of hogs being the best both for Maine and Texas, is as preposterous as that blubber is the best food for man, both in the tropics and at the north pole. A porkish organism, that carries just enough of "vital force" to be the most consistent with growth and taking on fat, at Galveston, would be almost as much out of place at Portland as a polar bear would in the jungles of

Bengal. And then the fine boned, small hog that would find a market at any moment near the Atlantic cities, and which matures at ten to twelve months, may not find a market at that age, and has to “slop over” four or five months, in the hands of the western farmer. The idea that a certain breed will make more pork to a given amount of feed than another, does not alone establish its superior claims to merit.

This is true, all other things being equal, but of itself, it is not true. We distinctly remember a certain gentleman who labored carefully for years for a cherished result of this character, and when he accomplished it, he found his sows brought him four pigs at a litter, and generally one litter a year. And then again, the hog that has “vital force” enough to suit the best conditions of development up in Maine, will neither take on fat nor nurse well down in Louisiana or Texas.

We do not urge anything in general terms against any particular breed of hogs, for there are peculiarities of climate and market in the country, to which certain breeds may be more or less, or exactly suited. We really think there are, and think we could name the breeds and localities, but there are other localities, climates, methods of production and market uncertainties to which no distinctive breed of hogs in existence is *exactly* suited.

While we utterly disclaim the offering of our opinions in any other than the suggestive form of investigation, we accept the risk of mentioning what we regard as some of the requisites of a good hog in all climates and localities. First of all then, is appetite. We want a good eater—a perfect gourmand—one that is always hungry, and will eat a little more after he feels that he has eaten enough; and breeding sows should have this appetite cultivated to the utmost extent, while growing, as well as while with pig. Next in importance is rapid and liberal reproduction. If a breed of hogs be not prolific, it lacks in a most important point. It makes a large item in the general results of pork growing, whether a breeding sow has one or three litters of pigs in a year. An

equally important consideration too, is whether she have four or twelve pigs at a litter.

Of course the appetite desired must have corresponding digestion and assimilation, and the rapid and liberal breeder must have corresponding nursing powers. It will not do to have a sow that brings you thirty-six pigs a year, so loaded down with vital force and preponderance of muscle, as to furnish milk for only one-third that number, and that only for four weeks at a time.

After these two general and leading properties are secured, you must regard that conformation and adjustment of vital functions which secures the most rapid development and greatest fattening facility with the least waste. In this, you can reach nothing demonstrative, without considering the extreme and sudden transitions of heat and cold, dryness and moisture.

The choice points of development must certainly not be neglected in the aggregate but collateral bearings of the calculations. It does make some difference in cash entries whether there are 50 or 150 pounds of the hog behind his shoulders. It does make a difference whether there be 10 or 25 per cent. of lard in the marketable results of what he eats. A few ounces less or more of souse, at either end, is not so material, except as an exponent of intelligent enterprise. Hence we conclude that whoever takes one breed of hogs as the standard index of porkdom's varied wants, is certainly given over to a very uniform sort of error.

FARM LABOR.

BY LEWIS CLARK, BELOIT.

It is a very generally admitted fact that one great check upon successful farming at the present time is the want of steady, competent and reliable help. Many who have invested their capital in lands and stock have gone out of it for the reason that this could not be obtained; and others have been, on the same account, deterred from entering upon agricultural pursuits.

The natural questions that arise are, why is it, and what is the remedy? In my opinion there is a combination of causes, probably many more than will now present themselves.

A new country like ours was mostly settled by pioneers with limited means, and in most cases so limited that they came here because they were unable to purchase in a settled country; without money to procure stock, their attention, as a general rule, was turned to the raising of grain. That was easily done by shallow plowing and no manuring. Very little fencing was done; one fence, in many instances, surrounded a number of farms.

It will readily be seen that but little steady help was needed. Those having boys of their own could manage the year around, except during the harvesting and threshing. The straw was burned as fast as threshed, except one or two piles upon which the stock wintered, going daily and helping themselves. The hiring of a man through the winter was a rare occurrence.

What became of the men that helped through the summer? Many went into the cities and spent, before spring, what they had earned in the summer; very few returned to fill the place they left the fall before. They went on railroads, in machine shops, and into various other employments where they could be steadily engaged. In looking among the machine shops, railroads, merchants and other branches of business we see

men who have been a large number of years in the same place. Not so among the farmers. Instances are rare where the same laborer is found the second year in the same place.

We can thus see that one reason why we have not kept good, steady, reliable help, to a certain extent at least, is because we have not given them steady employment.

Another, and perhaps greater, reason is the increased demand for skilled laborers in the many new branches of business that have sprung up in later years.

As our farms are getting older and more worn, we need much more labor instead of less. Many say, how are we to employ more men, when they take nearly all that we can earn, now our grain crops have failed so much? I answer by saying, we must change our mode of farming as circumstances will permit, and go more extensively into the raising of stock, and turn our attention more particularly to the raising of coarse products, such as corn, oats, potatoes or other kinds of roots for the feeding of said stock, and produce for market butter, cheese, pork, beef, mutton, wool, or anything else that will condense these coarser products, thereby saving freight, and giving winter as well as summer employment to our hired men. Each one of these branches of industry—stock-raising, producing butter, cheese, wool, etc., has its turn in paying well, and every farmer should be governed by his location and circumstances, as to what one, or how many of them he will undertake. Aside from the advantage of getting better help by thus keeping it for a term of years, summer and winter, we shall be driven into it sooner or later, or a large portion of our capital will be used up in the depreciation of our land. I would have the farmer who now employs three men in summer, keep two in the winter, or something like that proportion.

Mr. Farmer says, "there is nothing for them to do; ground all froze up, days are short and stormy, men can't do much more than earn their board." Mr. Laborer says, "I don't like to work in cold and stormy weather, at any rate if I did, I should want as much, or more than I had in the summer, and I will go into the village or city and hire my board four or five

months and get rested and, work enough harder in the summer to make it up." Now what is the final result? Both parties are the losers. Spring time comes again, and the farmer finds a multitude of things undone; many things essential to the successful cultivation of the soil have been neglected. The laborer finds his money nearly all gone, and is not as well fitted for labor as he would have been had he kept right along with Mr. F. through the winter, at such terms as Mr. F. would have been willing, or could have afforded to pay under a system of farming hereafter described, thereby saving the money earned under the "live and let live" wages agreed upon, and what he paid for board. All will agree that the longer one employs the same help the more he can afford to pay, as the employee so much better understands his way and manner of doing things. One of my neighbors gives two dollars extra, because the man worked for him last year. Some say, "how are we to get more help when we are so much troubled to get what we already have. I answer, under the steady employment system, I am trying to advocate, I calculate it will draw it from the cities and villages, where so many remain idle through the winter.

I think Chinese labor will soon be introduced through the country, if steady employment can be given them. Having lived among them in California for about six years, I am to some extent prepared to give an opinion as to their usefulness as laborers.

Most foreigners are looking forward to a home of their own. Not so with the Chinese; they want no land, but steady employment. They are small in stature, but strong and enduring, having been reared to toil and scanty living. They like money, and will want what they earn. They are good workers, and do not aspire to be anything but servants. They do not originate, but are great imitators. They surpass all other classes in doing just as they are told. One upon every farm, where more than one man is employed, would fill a place, and an important one, to the farmers wives, who find it so difficult to get kitchen help. "John Chinaman" can help, or can do the cooking; he

can wash and do up the fine linen as well as any woman. He can be made generally useful in and about the house, and, when not needed there, can work the garden in the best manner, or go into the field or among the stock; and he will do precisely as he is told, which can not be said of all laborers.

I suggest the following plan by which we shall be able to employ more laborers, and make it pay:

Winter more stock on the same amount of food, and raise more feed from the same land. Do more work in the winter that is now left for the spring and summer months. In wintering more stock on the same feed, I do not mean to say that we keep them too well now, but that by a proper application of more labor we will not only keep them better, but will also winter at least one-third more on the same feed; this can be done by applying the labor in housing, and more carefully giving out the food after it is prepared, so that all of the hay, as well as the coarser products, such as straw and corn stalks may be entirely eaten up by some class of animals. I think that any intelligent and calculating farmer who has kept what is generally considered a large amount of stock for the size of his farm, will readily agree with me when he looks on the amount of hay, straw and other fodder that has been trampled under foot, that if it had been prepared so that it could have been all eaten, he could have wintered 35 or 40 where he only wintered twenty.

The question arises, how can this be done? The first and most simple process by which to save the food is to arrange it so as to let one class of animals clean up the leavings of others. That is, feed the best and most nutritious food to milch cows, working teams, fattening animals, &c., in mangers or racks so as to be kept clean, giving them more than they can consume; what is left pass over with coarser fodder, to hardy animals, not designed for market the coming spring. These leavings to be thrown into the yards in dry weather, where strong colts, mules and hardy steers can work over them during the night. What is still better, I would have a straw cutter and cut up all the feed, such an one as will in addition to

other things, cut the largest corn, ears and all—costing about \$30, an additional cost of about \$40, will add a one horse power that will be of ample capacity for a farm of two or three hundred acres. I also would have all the straw as carefully saved by housing or stacking as the hay, and all the corn cut and nicely stacked before frost comes; also some oats, as well as any of the other kinds of grain, rye, wheat, &c., that would be unsalable if threshed, kept without threshing, for the purpose of cutting up. The whole of the above to go through the cutting box, mixed with roots, corn and meal, more or less according to time of year, and to what it is to be fed; following the same process as before mentioned until the refuse or leavings shall all be consumed by the most hardy barn yard stock. To the above it will only be necessary to add and mix in meal to the amount of the grain ordinarily used to fatten and keep the animals in good flesh. A stack of oats can be cut up for feeding by hand power as cheap as it can be threshed with a machine, and with the addition of a little meal, is entirely eaten up. Still, an additional amount of animals can be kept by applying steam to the above-mentioned compound of cut feed, as has been already proved by many farmers in this state, and in other places. It is easy to see that the above process will require winter work, and it has already been proved that it will pay; and here is just where the profit comes from, viz: the using up of this coarse fodder, that would otherwise have been lost, or nearly so.

Hauling manure in winter can be practiced much more extensively than people generally imagine, provided there is help ready at the time to do it. One will say, "Manure should not be hauled till well rotted in the yards." Another will say, "No place to put it, in the winter." In answer to the first, I will say, haul every day, or as fast as made if practicable, as the first years' benefit is fully lost if left in unsheltered places, exposed during the summer to drenching rains and evaporation. For some crops, and on some land, I think the products are doubled the first year. On tolerable sized farms, well stocked, and where the cattle are stabled, as they ought to be.

one or more loads could be hauled to the field each morning, before freezing. Basements ordinarily warm can be cleaned a number of times during the winter. Open sheep, or other sheds can be cleaned as often as there comes a general or partial thaw, no matter how green or coarse, if lain upon or run over by the stock.

In regard to the second query, where to put it, I will say, fall-sown rye can be covered all over, any time before it commences to grow in the spring. Rye will come up through it, and however coarse, it will be out of the way of the reaper, and not in the way of the mower if seeded down the next year. So far, I have never failed of about doubling the crop of rye, or of a good seeding to clover and timothy, and with an ordinary amount of rain, a good yield of grass for years. In all cases of winter hauling I would spread as fast as hauled. It can be spread upon land to be plowed for corn, upon pastures, or any place except grass land that is to be mowed the coming season.

In addition to the above winter work, every practical farmer will find a year's work to fit up, materials for fence to be prepared, rails split and hauled to the places needed, and perhaps laid up. Posts split, sharpened, hauled to the place to be used, ready to be set as soon as the frost is out of the ground, when it can be done with one-half the labor required after the ground becomes dry and settled. Corn cut and properly set up and bound with wet rye straw, can all be hauled, husked and fed in the winter, the corn being well cured, and the fodder much more valuable than it is after being handled over a number of times, breaking off and losing many of the leaves.

Materials for building and repairing can be hauled, and most of the wood-work completed. Hay racks and farming tools may be made and repaired; apple and other fruit trees mulched, which many think necessary to secure a good crop. These, and other things too numerous to mention, can be done in the winter, which will save taking valuable time from the putting in, cultivating and securing of crops in the busy months of spring and summer.

COMMUNICATIONS.

BEE-CULTURE AT JEFFERSON.

WM. WOLFF'S APIARY.

DR. J. W. HOYT, *Secretary Wisconsin State Agricultural Society*:

DEAR SIR: The season of 1870, like a number of its predecessors, was unfavorable for bees; still, for a season so poor, we made a fair profit, and feel assured that the raising of bees, both for stock and honey, can be made a good paying business in this state. I commenced to keep bees in the spring of 1863. My stock at that time consisted of one swarm of black bees, in a common box hive. The following season I bought about a dozen colonies, and commenced to use movable comb hives. I now use Longstroth's hive altogether, and think it is much the best, plainest and most practicable in its principle, but for northern latitudes I prefer greater depth of frame than he uses in his common hive. I make my frames twelve inches deep.

The bees kept in this section are mostly Italian. My own stock is nearly all pure Italian. Where there are black or impure drones kept in surrounding apiaries it will sometimes happen that the queen bees will become fertilized by them, and where this is the case, although the queen may be a full bred Italian, her progeny will be a hybrid or cross between the Italian and black bees. I regard the Italian as superior to others in every particular, and will warrant them to give entire satisfaction to every one, where they are rightly managed. A cross-breed would probably be more profitable for Wisconsin were it not for their quarrelsome disposition.

The Italians are superior to common bees in that they are more active and industrious, and consequently will gather greater stores of honey. They work early and late, and will continue to gather in the fall when black bees have ceased to store. They breed earlier and faster in the spring, and will cast earlier and larger swarms. The workers live considerable longer than those of the black bee, and therefore they have a larger working force. Killing the drones off earlier in the season, and carrying a smaller stock of workers through the winter, they consume a smaller amount of honey than the black bees; yet they are susceptible to the cold and need more protection from the severities of winter. They keep their hives cleaner, and consequently are generally more healthy. They do not let any worms grow up. My apiaries are almost free from bee-moths, and I never heard of an Italian colony being destroyed by moth worms. They

are more peaceable, especially in the vicinity of their hives. When handled they adhere more closely to their combs, and are more easily managed. They are stronger and more watchful, and are not in danger of being robbed.

In the winter of 1869 and 1870 I put 100 swarms into winter quarters, but owing to dampness and the small amount of honey gathered during the previous summer 30 swarms died; ten of the best colonies I sold in the spring, ten more were so weak as to be of no account, so that I entered upon the season of 1870 with only fifty good swarms. From these I had 30 natural swarms, and 20 artificial ones. The yield of honey was 1,500 lbs. box honey, and 2,000 lbs. strained. The season was so hot and dry that the amount of box honey gathered was small. The strained honey I took from the main hives with the honey extractor. By the use of this extractor triple the amount of honey will be obtained, for by preserving the comb for the use of the bees, it saves the consumption of a large amount of honey, necessary to make new. In this way but little wax will be obtained, but the wax adds little to the income of the bee keeper, and he can well spare it to secure the increased production of honey. Strained honey does not sell as readily as the box, but when put up neatly in glass jars, I have sold it from 20 to 25 cents a pound, while I got from 25 to 30 cents for the box honey. In common jars I sold strained honey for 16 to 20 cents per lb. I realized from honey sold in 1870, \$625.

I have sold but 11 colonies and 20 queens during the season. The sale of bees from my apiary is limited, owing principally to high price (\$20 for a full swarm), but I hold the bees to be worth as much as I can realize from them—\$14.00 per hive in honey, and one new swarm on the average. The amount received from the sale of bees in my apiary for the year is \$225.00, making the total profits of the year \$850.

I have had considerable trouble in carrying the swarms through the winter in good condition. To do this successfully is the chief point in bee-culture. A swarm that enters upon the season's work early, strong in numbers will yield a large profit, while those that are weak, lose a large portion of the honey season in recuperating, and do not lay by any surplus stores until late in the season, if at all. I have built a house above ground, with double walls, filled with sawdust, 12 inches thick, to winter them in. Here they wintered very well, but I did not give sufficient ventilation, and towards spring the temperature became too high, and the bees being uneasy, crowded out of their hives considerable. But, altogether, my bees never entered upon their season's work in better condition. The bee moths give my bees but little trouble; the Italians are nearly moth proof.

The main source of our honey crop in this section is from the white clover and linden; some seasons large fields of buckwheat are sown, which yield considerable quantities of honey. Besides these we have the maple, willow, elm, fruit trees and a large assortment of natural flowers which serve to fill out our stores of honey.

Respectfully yours,

JEFFERSON, May, 1871.

WM. WOLFF.

ADAM GRIMM'S APIARY.

DR. J. W. HOYT, *Secretary Wisconsin State Agricultural Society*:

DEAR SIR:—My stock of bees is very large, and as this is the busy season with them, they take up most of my time, so that it will be impossible for me to send you more than a brief report of my Apiary. This is the 6th season in which I have made bee-culture a business, but I have been interested in bees, and have kept a small number of stocks ever since I was seventeen years old.

I commenced the season of 1870 with 600 colonies of bees, but of these, all but about 100 were in a weak condition; thirteen colonies were sold, and I reserved about the same number for rearing queens; of the balance quite a number were queenless. From these I obtained 315 new swarms. For the purpose of strengthening, and also to diminish the number of my stocks, I took up and united 173 colonies. My bees usually make a surplus over and above what is needed for their own sustenance, so that I seldom find it necessary to give extra feed. Two years ago was an exception; the honey crop was very light and a large number of hives had to be supplied with food. When it is necessary to feed, I give honey as long as I have a supply. The syrup made of white coffee sugar answers a very good purpose in the spring when the bees can fly.

My bees are mostly Italians; they are *the* breed, and the longer I keep them the better I like them, in fact I would not take black bees as a gift, if compelled to keep them as such. I use the shallow-framed, Langstroth hive, and like it better than any hive I ever tried.

The surplus honey obtained from my Apiary the past season, including that taken from the 173 stocks taken up, amounts to 22,725 pounds. I have sold all but about 4,000 pounds of this, realizing on an average, after deducting all expenses, 19 cents per pound, or \$3,557.75 in all. My stock has been reduced by sales considerable. Early in the spring I sold 13 full hives, and later in the season disposed of quite a number of young swarms, shipping them to different parts of the Union. In January, 1871, W. D. Roberts of Utah Territory, bought of me 325 swarms for himself, and 40 for a neighbor, to ship to that place. For single colonies I receive \$15 each, but when quite a number are taken, I make a discount of from a quarter to one-third.

Have had very little trouble in wintering my stock; do not lose on an average over $11\frac{1}{2}$ per cent. during the five months they are in winter quarters. I use cellars for storing.

Our experience with Alsike clover has been far from satisfactory; it yields very little honey with us, and has little value for other purposes.

Respectfully yours,

ADAM GRIMM.

JEFFERSON, May, 1871.

TOBACCO IN DANE AND ROCK COUNTIES.

DR. J. W. HOYT, *Secretary Wisconsin State Agricultural Society*:

DEAR SIR—Few of the inhabitants of our state are aware of the extent to which tobacco is raised in this section, or of the mode of cultivation. Being tobacco growers, and believing that this crop is destined to bear an important part in the industry of our state, and in the development of its resources, we the more readily comply with your request to give a few of the leading facts pertaining to the cultivation of this important crop.

Mr. Ralph Pomeroy and brother are undoubtedly the pioneers in the raising of tobacco in this state. Their experience in this business, first, at Suffield, Connecticut, and later, at Dayton, Ohio, gave them guaranty of success. In 1853, they raised a crop of nine acres on Syene Prairie, near Madison. The following year they transferred their operations to this place. Those of us who were their neighbors watched their experiments—as we then regarded them—doubtfully, but being practically convinced of their success we soon fell into the ranks as producers. Now the amount raised in this section exceeds four thousand cases of three hundred and sixty pounds each, nearly a million and a half pounds, worth, at last season's prices, over \$200,000 to the growers. The above figures would indicate between ten and eleven hundred acres devoted to this crop. The average price will probably be about fourteen cents a pound.

This demonstrates clearly that the business is no longer an experiment; the early growers have fully proved its practicability, its quality and value as a market product. Many suppose that the Connecticut valley produces the best seed leaf tobacco in the United States. This is the fact in the same sense that Orange county butter is better than the same grade in other counties. Many eat the savory article, bought at a fancy price, not knowing that it is the product of some Pennsylvania, or Ohio dairy, instead of those in Orange county; so too, many a man may smoke his Connecticut cigar, warranted pure, in blissful ignorance that its splendid wrapper, and perhaps the whole of it, was raised in Dane or Rock counties.

No man need expect to engage profitably in the production of tobacco, without first making up his mind to do some work, and at the time too when the crop requires it. If he neglects the work, the quality depreciates, and instead of raising as good as we can in Wisconsin, he may raise as poor as they do in Connecticut.

The time of sowing seed in beds, is as early in spring as the ground will work freely; then the ground should be thoroughly prepared, and the seed be sown broadcast upon the surface, and rolled, not raked, in. These beds should always be kept free from weeds, cost what time and labor it may. Should the weather be dry, the beds must be watered, until the roots of the young plants penetrate the moist earth below. Most of the growers sow an

ounce of seed for each acre to be set out, not expecting to use all the plants, but to be safe as to quantity and to give opportunity to select the strongest and best. The plants should be set out in the fields as soon as they have acquired sufficient strength, any time in June, the earlier the better.

The land where they are set should be liberally manured each year, if possible; not because the crop uses so much more than other crops, but because very much depends on the rapid growth of the plant; this gives quality and color, hence the land should be in high condition. The more thorough the cultivation, the oftener the soil is stirred, the better will be the crop.

As soon as the blossom buds appear, the plants should be topped, taking off with it five or six leaves. Breaking off the tops will force the growth of the suckers. If the season is warm and wet, the suckers must be removed a number of times. No specific rule can be laid down, but that the suckers must be kept back, and before cutting, must be taken off clean. The tobacco usually ripens in ten days or two weeks after it is topped. When sufficiently matured the plants are cut and strung upon lath, six or seven plants on each. For this purpose a steel point, with a socket to fit the end of the lath is used, this is forced through the large end of the stalk. The tobacco is then drawn to the sheds and hung upon racks, constructed so as to leave six or seven inches between the tiers. As these sheds are generally built, it requires about 1,500 feet of lumber to store an acre of tobacco.

The actual cost of cultivation varies with the season; it is usually from \$35 to \$40 dollars an acre, including interest on cost of fixtures. The market value of the crop depends both upon the condition of the market and the quality of the tobacco, ranging all the way from \$50 to \$300 per acre. The crop for 1870 was of a much better quality in texture and size of leaf than that of Connecticut or Ohio, and will command better prices in the market. This was caused by the long continued drouth at the east, while we had timely rains when the leaf was filling.

The idea generally prevails that raising tobacco soon exhausts the soil, from the fact that such has been the case in the south, but we do not believe that it can be done any sooner by continual cropping with tobacco than with wheat. The practice with Southern planters has been to clear new lands and crop as long as it would pay for the labor, and then turn the land to waste. The lands need to be kept in good condition by high manuring, as we have said before, to secure rapid growth; where this is done, crop after crop of tobacco can be raised without any apparent diminution of quantity or deterioration in quality; in fact the best crop raised in this section the past season was the seventh consecutive crop from the same land. Sowed crops do not follow tobacco well, except in very dry seasons, on account of the rank growth of straw induced by the richness of the soil; but were we to undertake to raise one hundred bushels of corn to the acre, the land we would select as the most likely to yield it would be our oldest

tobacco land. Manure is prerequisite to success in raising tobacco, corn or any other crop, and if the tobacco lot robs the corn field, its place must be supplied with clover or some other fertilizer.

Respectfully yours,

M. H. SOVERHILL.

RALPH POMEROY.

FULTON, WIS., March, 1871.

CRANBERRY CULTURE.

DR. J. W. HOYT, *Secretary Wisconsin State Agricultural Society*:

DEAR SIR:—I am not prepared to give a very complete or satisfactory account of the method, or the extent of the cultivation of the cranberry in this section, owing to my limited knowledge and information on the subject; but the main facts that have come under my observation, or which I have learned by experience, I will note down for the benefit or gratification of those who are interested in this subject.

There has been but very little actual cultivation of the cranberry with us; in fact the whole question as to the best method of culture remains yet to be determined by time and experiment. We have no guide, no rules, and but little experience in the business. We cannot avail ourselves of the methods in practice by eastern plantations, for in many respects they are not applicable. In some instances vines have been planted, and have done well; new beds have been set out, and old fields, where the vines were thin and weak, have been stocked anew and are paying well. Those setting out plants, select a soft marsh, where there is but little grass or brush, for it is in such soil that the berry thrives best. Land where the hard subsoil comes near the surface is not suitable. Vines are pulled or broken off from the old plants, and cut up into slips from six to ten inches in length; these pieces are laid on the ground, where the hills are desired, and the middle is crowded down with a stick into the soft ground, leaving the two ends out. Two or three inches in the ground is sufficient, as the slips take root very readily in any part. The vines are usually set in hills three feet apart each way, and from one to four slips in a hill. They grow very rapidly, and soon take full possession of the ground.

Although but few new plantations have been started, much has been done to improve the original fields. These, ten years ago, were in their natural state, the vines thin and feeble in their growth, were scattered over the marshes. The fields that are now the most productive, then yielded but small and uncertain crops. The producing capacity of the best fields is steadily increasing, but it is still far below what it should be. I consider one hundred bushels to the acre a moderate yield. The improvements made, consist principally, of draining the marshes, and constructing a system of drains and ditches, by means of which the vines can be flooded. Drainage

increases the growth of the vines, giving greater vigor and consequently enhancing their productiveness. Flowing has the same effect, and serves to check the ravages of the cranberry worm and insects, which at times cause great damage. My marsh is probably improved as much as any in this section. I have built a good substantial drain, which will hold two feet of water, with a good outlet. I have also dug ditches two feet wide and twenty inches deep, once in five rods across the marsh. We find by experience that it increases the quantity, and improves the quality of the berries, as well as adds greatly to the surety of a crop, to flow the vines during the winter; from the first of November to the first of May or June, according to the season.

The picking is mostly done by women and children, but the past season men made good wages at it. I paid seventy cents a bushel for picking the last crop. This, with other expenses, make the cost of harvesting one dollar a bushel. I sold the crop at four dollars a bushel.

We estimate that only about one-fourth of the land in this section suitable for cranberries is under cultivation; yet, from present indications, we do not apprehend that there is any danger of the business being overdone; for notwithstanding the yield has increased year by year, there has been a corresponding advance in market value. About 10,000 barrels of berries were sold in this market in 1870, at prices varying from \$9 to \$15 a barrel; while nine years ago, (in 1861,) they were a drug at seventy-five cents a bushel; less than some pay now for picking. At that time they were gathered on shares, one half going to the picker.

Yours with respect,

J. D. WALTER.

BERLIN, March 1871.

AGRICULTURAL DEPARTMENT OF WISCONSIN UNIVERSITY.

DR. J. W. HOYT, *Secretary Wisconsin State Agricultural Society*:

I herewith send you a brief article, presenting some facts which may be of interest, respecting the plans, and some of the experiments being tried by the Department of Agriculture of the University of Wisconsin.

This Department, organized under the act of Congress of July 2, 1862, known as the "Agricultural College bill," has been in operation for three years. It has a complete course of study, in which are combined the theoretical knowledge and the practical application of those sciences with which the farmer, the gardener and the fruit grower are constantly dealing.

Agriculture, as a science, is wide in its range, embracing all the natural sciences. Botany, zoology, physiology, chemistry, geology, mechanics, physics and meteorology, are the foundation stones upon which a proper knowledge of agriculture must be built. It is the design of this department to give the most thorough theoretical instruction in these sciences,

while at the same time it will make this instruction as practical as may be by showing how the principles apply to practice.

Besides this special instruction in the sciences, other studies are taken from the course in the College of Arts, making it parallel with that course, and in all respects equal to it in the training and discipline which it will confer. It is, as expressed in the language of the act of Congress, a course of study that will "promote the liberal and practical education of the industrial classes."

An experimental farm is carried on in connection with this department, the object of which is to experiment in new and untried varieties of grain, fruits, and vegetables, and to carry out a series of experiments each year, that by showing their success or failure, will be of great practical value to the farmers of the state. The facilities of this department, for successful experimenting, are increasing yearly, and it is confidently believed that, at no distant day, it will be of great benefit to the state at large, as a source of valuable information upon subjects pertaining to agriculture.

Many students are dependent upon their own exertions for the means necessary to defray the expenses of an education. All such students who desire it are furnished with work upon the farm from one to three hours a day, for which they are paid twelve and a half cents an hour. During the spring term of the present year—1871—over \$600 have been paid to students for labor. Much of this labor, such as working in the vineyard, the orchard, and in the fruit and vegetable gardens, is a source of of useful information to those intending to follow farming, or fruit growing as a business. To those who desire it, special instruction is given in the care of vineyards, orchards, and nurseries, as well as in the culture of small fruits and vegetables, and in the methods of artificial propagation of all kinds of plants.

It is the design of this department to do whatever may be for the material advancement of the agricultural interests of the state, by the dissemination of correct theoretical and practical intelligence pertaining to the wants of farmers and fruit growers.

Below are some of the experiments tried during the past season.

WINTER WHEAT.

Treadwell Variety—White.—Weight of seed 60 pounds to the bushel.
* Sample 1. One and three-fourths bushels, sown September 18, 1869, upon one acre of ground sloping to the northwest and protected on the west by a belt of timber. Snow fell upon this wheat November 17; ground not again bare until March. In first part of February one-half the piece was mulched with coarse manure to prevent the injurious effects of alternate freezing and thawing during the spring months. Harvested July 12, 1870. Weight of straw and grain as drawn from the field, from part

*The number of this sample in this and all following cases refers to labeled specimens kept in my office.

mulched, 980 pounds; from part not mulched, 420 pounds. Yield of mulched portion, $330\frac{3}{4}$ pounds— $5\frac{1}{2}$ bushels. One bushel weighs 60 pounds. Yield of portion not mulched, 194 pounds— $3\frac{1}{4}$ bushels. One bushel weighs $59\frac{1}{2}$ pounds.

Mediterranean Variety.—Weight of seed 57 pounds per bushel. Sample 2. One bushel and 18 quarts. Sown September 18, 1869, upon one acre of ground, lying as in preceding experiment, and protected in same way. Mulched as in Treadwell variety. Harvested July 11, 1870. Weight of straw and grain, as drawn from field, from part mulched, 260 pounds; from part not mulched, 85 pounds. Yield of portion mulched, 81 pounds. Yield of portion not mulched, $44\frac{1}{2}$ pounds. One bushel weighs $56\frac{1}{2}$ pounds.

While these experiments show that winter wheat cannot be made a profitable crop here, they also show the beneficial results of even a light coating of mulching. These effects would doubtless have been more marked had the mulching been applied in the fall.

White Winter Touzelle Variety.—Seed imported from France, and furnished by Department of Agriculture at Washington. Sample 3. Weight 64 pounds to the bushel. Thirteen quarts sown September 18, 1869, upon one-third of an acre. Ground protected as in above varieties, and mulched at the same time. This wheat was killed entirely.

SPRING WHEAT.

Experiment to compare the value of produce of wheat and corn per acre. (See first experiment under corn).

Seed of "Mammoth" variety; weight 57 pounds per bushel. Sample 4. One and one-half acres sown April 22, with $1\frac{3}{4}$ bushels per acre. Harvested July 29. Yield 1,006 pounds—16.7 bushels. One bushel weighs 61 pounds.

The average price of wheat and corn in this market for the past five years, 1866 to 1870 inclusive, as reported by the *Wisconsin State Journal* for the last week in October, is as follows: wheat, \$1.35; corn, \$0.59. At these prices the value of the yield of grain per acre, of these different crops, would be: of wheat, \$14.35; corn, \$31.00. The greater value of the stalks than of the straw for fodder, makes the balance of the value of the produce still greater in favor of corn.

CORN.

To compare profit of raising corn with that of wheat $1\frac{1}{2}$ acres planted to Dutton variety May 8, in drills $3\frac{1}{2}$ feet apart; hills 20 inches apart in drill, two stalks in a hill. Harvested August 30: Weight of ears, 5,538 lbs.; weight of stalks, 4,760 lbs. Allowing 70 lbs. of ears for one bushel of shelled corn, this yield equals 79 bushels corn.

For comparison of values see experiment with wheat.

Arickaree Corn raised by "Ree" Indians of northern Dakota. Grows

there from eighteen inches to two feet in height, and is said to produce corn fit for eating in seven weeks after planting. Seed obtained of Regent N. B. Van Slyke. A few hills of this variety were planted May 9; the most forward ears upon which were thoroughly glazed and ripe July 29, or 81 days from time of planting. The ears are small, the grain white. It will be of little value, only for a very early variety in gardens.

Hon. W. W. Field, of Boscobel, exhibited at the State Fair in 1869, a stalk of pop-corn bearing ten fully ripened ears. Fifty hills were planted with seed from this stalk to ascertain if this prolific tendency could be fixed by propagation. No stalk of these fifty hills bore more than three ears.

Method of Saving Seed Corn.—In 1869, from the same field of the Dutton variety, some of the earliest ripening ears were picked and traced up immediately. The stalks bearing others of the earliest ears, were cut and the ears allowed to ripen upon the stalk. And at the time of husking, seed was saved in the ordinary manner, with no reference to its time of ripening. Plats of each of these varieties of seed were planted the past spring, and seed again saved from each plat in the same manner as that from which the plat was planted. It is proposed to continue this experiment through a series of years to ascertain to what extent the time of ripening may be changed by care in selecting the earliest maturing ears for seed. There was no visible difference between the plats this season.

To ascertain the relative value of seed from different portions of the ear, as from the tips, the middle and the butts, adjacent plats were planted last spring with seed from these different parts. Seed has been saved from each plat, which will receive similar treatment another year, the butts of ears raised from butts alone to be planted, that from the middle of the ears raised from middle, etc.; the same treatment to be continued for several years. No weighed results are reported from this experiment this year, as the seed was purchased and was all poor. Even that from the middle of the ear did not all germinate.

OATS.

To compare the different kinds of oats now in cultivation, five varieties were sown, as follows:

Ramsdale Norway Oats.—One and one-fourth bushels sown April 27, upon $\frac{1}{2}$ acre of ground. One bushel weighed $33\frac{1}{2}$ pounds. Sample 7. Harvested August 9. Yield by weight, 378 pounds. Weight of one bushel, 24.4 pounds. Yield per acre, 23.6 bushels.

Surprise Oats. One and one-fourth bushels sown April 27, upon $\frac{1}{2}$ acre. Weight of one bushel, $41\frac{1}{2}$ pounds. Sample 8. Harvested July 18. Yield by weight, 184 pounds. Weight of one bushel 26.3 pound. Yield per acre, 11.6 bushels.

White Norway Oats.—One and one-fourth bushels sown April 27, upon

1/2 acre. One bushel weighed 37 1/2 pounds. Sample 9. Harvested July 18. Yield 220 pounds. Weight of one bushel, 26.5 pounds. Yield per acre, 14 bushels.

Common White Oats.—One and one-fourth bushels sown April 27, upon one-half acre. One bushel weighed 29 1/2 lbs. Sample 10. Harvested August 9. Yield 463 lbs. Weight of one bushel 22 lbs. Yield per acre 29 bushels.

Potato Oats.—Seed imported from Scotland and furnished by Department of Agriculture at Washington. Eight quarts seed. Sown April 35, upon one-eighth of an acre. Sample 6. Harvested August 9. Yield by weight 100 lbs. One bushel weighs 26.6 lbs. Yield per acre 25 bushels.

These oats were all very seriously affected by the drouth, yet as the treatment was in all respects alike, except that the seed of the Potato oats was not weighed or sown quite as thick, the yield shows the relative value of the varieties for such a year as the past. The soil upon which they were grown was clay loam with clay subsoil, and was in a good state of cultivation. The following table gives the relative as well as actual product:

	Yield per acre.	Weight of one bush.	One lb. produced.
Ramsdale Norway	23.6 bu.	24.4 lbs.	9.0 lbs.
White Norway	14.0 "	26.5 "	5.0 "
Surprise	11.6 "	26.3 "	3.7 "
Common.....	29.0 "	22.0 "	12.5 "
Potato.....	25.0 "	26.6 "	.....

CHEVALIER BARLEY.

Seed imported from Scotland, by Department of Agriculture, as an excellent variety for malting. Eight quarts sown April 25, upon one-eighth of an acre. Sample 5. Harvested July 22. Yield, 84 pounds. One bushel weighs 44 1-2 pounds. Yield per acre 14 bushels.

GRASS.

The following experiments have been begun for the purpose of ascertaining if very heavy seeding is more or less profitable than the common method of light seeding.

Four adjacent plats of ground, containing one-fourth of an acre each were sown April 18, to different quantities of grass seed—a mixture of equal parts, by measure, of clover and timothy. The severe drouth will doubtless injure the accuracy of the results that might otherwise have been obtained from this trial, but it cannot at present be determined how great the injury will be.

POTATOES.

The experiments in seven different methods of preparing the seed, planting the product of each method in the same manner the second year, that were begun in 1868, were continued the present year.

Men were set to digging these potatoes without my knowledge, mixing the product of the different methods of treatment so that no results can be reported.

The experiments in hilling and flat culture were interfered with in the same manner.

Early Rose Potatoes.—One-eighth of an acre of ground was planted to this variety for the purpose of ascertaining the rate of increase in field culture. 227 potatoes, weighing 54 pounds, and making 825 hills, were planted upon the plat May 10. Rows 3 1-2 feet apart, hills 20 inches apart in the row. Fully ripe, and vines dead August 5. Dug August 31. Weighed 758 lbs., yielding at the rate of 101 bushels per acre. One pound of seed produced 14 pounds. From time of planting till full ripening of plants, 87 days.

W. W. DANIELLS.

PRACTICAL LUMBERING—HOW IT IS DONE.

DR. J. W. HOYT, *Secretary Wisconsin State Agricultural Society:*

DEAR SIR—Since receiving your request for a paper on the methods of practical lumbering, it has been out of my power to comply. And even now, I am so pressed by manifold duties that it will be impossible for me to furnish you with more than a brief and hurriedly written communication, which you are at liberty to accept or reject at your own discretion.

A logging camp is quite an institution. From fifteen to twenty-five men, with four to six teams, and a good cook—who is the busiest and hardest worked person in the lot—compose the crew. The logger, who is himself the owner of the pine land or lumber, or a contractor to put in logs from lands belonging to others, is the head-man or superintendent of the gang. Unlike the old fashioned state of Maine, where the shanties are low and dark, with a big smoking log fire in the center, with half the roof open for a chimney, they now build nice log shanties with windows and floors; one for cooking and eating house, with large cook stove and modern conveniences; another, with bunks upon each side, and a heating stove in the center, where the men sleep and sit evenings and Sundays. Others again for stables for teams, made warm and comfortable, and for storing the hay and feed. All these are covered with shakes (long rived shingles) or boards, which make tight and warm roofs. The cracks between the logs are nicely and warmly mudded up. These shanties are the first things built in the fall, and are located on or near good water in as convenient a place as may

be for the work: Next follows the making of wide and smooth roads from the timber to the bank of the river where the logs are to go; and the better the logger, the better his roads, thus saving much flesh of teams and breaking of harness and sleds during the winter.

When these things are prepared, the men with the teams and supplies go in to their quarters, and the work commences. With the first light of morning the choppers start out, and soon the pine trees are heard falling in quick succession. When cut down, the trees are marked off into any desired length, all the even numbers between twelve and thirty-two being used. The sawyers follow with their cross-cut saws, and cut the logs into the lengths indicated. At the same time another set of hands, called "swampers," are engaged cutting away the brush and old logs, making roads for the skidding teams. During the early part of the season before snow comes they are cut and skidded up. For this purpose spry and active oxen are generally used, driven by a teamster skilled in hauling and rolling logs to the skid-ways or upon the sleds. When the timber is near the stream, and not more than a half mile to haul, the logs are usually hauled on a crotch or travis, called sometimes "go-devil," to which a team is hitched with a chain, one end of the log dragging upon the ground. Later, when the sledding is good, additional teams are brought in, with wide sleds which will take on 1,000 or 1,500 feet each load, and one pair of mules, horses or oxen take six or eight of these loads each day from the skid-ways to the roll-ways on the river. Here the scaler lays on his rule and takes the number of feet board measure as the logs are unloaded, and stamps with a hammer stamp each log upon the end. A bark-mark is put on the side with the axe, and the logs are then rolled over skids and put regularly upon the roll-ways on the bank of the stream, where they remain until the high water of spring. While sledding is good in the winter the teams are loaded, as they say from the stump, the logs being rolled directly upon the sleds. This saves the labor of drawing upon the skid-ways. Two teams are kept busy most of the winter hauling in hay, feed and supplies for the camp. It is busy work, and every man and team, while daylight lasts, are constantly in motion, making the woods echo with the sound of their axes and voices. It is also healthy work, and most of the men come out fat in the spring. They are well fed with plenty of good pork, beef, bread, potatoes, beans, butter, tea and coffee—the meals are more desirable and better got up than most of the hotels furnish—and *no whiskey*. There is good order, and quarrels among them are now rare. So long as snow and timber lasts, all continue to work, and the average quantity put in by each camp is two to three millions feet. Late years there has also been a change in the working and handling of teams; now they are well cared for, do better work and come out in the spring, after a big winter's job, in fine condition, and ready for continued work.

The cost of logs on the river bank varies according to their quality, from \$3 to \$5 per thousand feet, with \$1 added for stumpage or timber.

When the ice breaks up in the spring, and the high water comes, the men with nails in their boots, and handspikes in their hands, go at the rollways and "break" them, by rolling the logs into the river, and putting them afloat. Then these men, "drivers," follow them down; some are stationed at different points along the river where the bad places, falls, islands, tow-heads and short bends are, and prevent the logs from forming jams, and when stopped, at any place, break the jams and keep them going until they reach their destination. Breaking rollways and jams is dangerous work, and requires men of great activity, strength and good judgment. Such men command for this work from \$3 to \$5 per day. They can also ride a log, or handle it in most places, and it is wonderful how many of them will venture on a log and control it. During the drive, the cook and helper follow up, giving not less than four meals per day, camping at night where they find themselves, at the tail end of the logs. Small and large batteaux, and dug-outs, are used, and a crew of men with cant hooks "sack" in the logs which are thrown out and stopped along the banks and sloughs.

Such is a short description of logging and driving. We now have the logs in the ponds or booms above the mills, ready for manufacturing into lumber. Most of our people have seen saw mills, but many have not been in the large mills in this section which manufacture 100,000 to 200,000 feet per day. These mills have rotary and gang saws, with edgers of two to five saws each. The logs are hauled into the mill, and go through the saws. The lumber is passed through on rollers, and dropped upon a platform below the mill; there it is assorted, and rafted on slides into cribs 16x32 feet, and from 12 to 20 inch courses deep, bound off with plank, wedged up tight, then top loaded with lath and shingles, when the pin is knocked out, and up one end and down the other, on the slide it goes off into the river. Rafts of 18 to 28 of such cribs are coupled up together, oars put upon each end, and a man to each oar, with a pilot who runs it down to the Mississippi river. There, about eight of such rafts are formed into one, covering about two acres of surface, and containing from one to two million feet of lumber, to go down the Mississippi.

From the slabs large quantities of lath and palings are made. From the hollow logs, and other logs not good for lumber, shingles are made.

It costs to manufacture lath seventy-five cents per thousand, and about one dollar per thousand for shingles. To raft lumber, about forty cents per thousand, the sawing about two dollars per thousand. The running from mills to St. Louis, two to three dollars per thousand.

The Chippewa and its tributaries are now sending out, in logs and lumber, 250,000,000 feet annually.

EAU CLAIRE, March, 1871.

J. G. THORP.

INDUSTRY OF COUNTIES.

ADAMS COUNTY.

BY JAMES HINMAN, OLIN.

Adams county, situated on the east side of the Wisconsin river, is bounded by Juneau county on the west, Wood on the north, and Sauk on the south, and contains seventeen townships, with a total population of 6,713. A large portion of the county is yet unimproved. The number of acres improved is 42,913. Our soil is a sandy loam, well adapted to the cultivation of the various farm products. Wheat in 1870 was about an average crop; the total yield was 121,010 bushels. But little winter wheat was sown; the average was about fifteen bushels per acre. Rye—yield eleven bushels; total, 52,932 bushels. Oats—twenty-five bushels; total, 80,276 bushels. Barley—yield twenty-eight bushels; total, 2,479 bushels. Corn was excellent, well ripened; yield thirty bushels; total, 129,469 bushels. Potatoes were much injured by the beetle; still, the yield was large—62,960 bushels.

Clover and timothy do well here, yet but little is sown, as our farmers depend mostly on the wild meadows for hay, with which the county abounds. Considerable clover seed is raised; the yield is from four to eight bushels per acre. Hops are largely cultivated; the crop of 1870 was 204,020 pounds.

But little attention is paid to stock-raising as yet; still, some fine stock is owned in the county. Our dairy products for the year were 268,150 pounds butter, and 8,719 pounds cheese. The clip of wool was 28,193 pounds.

But little manufacturing is done in the county, except in flour. There are quite a number of fine water powers yet unimproved. The county is well watered; springs and small creeks abound. Our climate is dry and healthy. The county is rapidly filling up with emigrants, but there are still many good chances for getting fine farms. There is a prospect of several railroads being soon built through the county, or along its borders, which will much improve our market privileges.

ASHLAND COUNTY.

[From the State Immigration Pamphlet, 1870, with corrections and additions by S. S. FIFIELD.]

Ashland county contains an area of about 1,200,000 acres, of which 166,000 are state lands, and a large amount government lands—many of them being among the most valuable lands in the state. The Penoke iron range lies in this county, and only awaits development to show that it is one of the best and most extensive in the United States. Being only twenty-three miles from Lake Superior, this valuable deposit cannot long remain unimproved, and the time must soon come when a large number of laborers will find employment upon this valuable iron deposit.

La Pointe, its county seat, is one of the oldest settlements in the state, it formerly being a Catholic Mission, established by the Jesuits, soon after the settlement at Green Bay.

The county is heavily timbered with pine and hard wood; well watered, and has many fine water powers upon its numerous streams. There are many large tracts of hard wood, agricultural lands that produce abundant crops of spring and winter wheat, oats, rye, barley, potatoes and vegetables. Grass, however, is the best crop, and in a few years, when railroads have pierced the wilderness, stock-raising will be one of the chief sources of wealth. Apples, pears and plums, as well as nearly all varieties of small cultivated and wild fruits do well, and there is no doubt but what in years to come, fruit will be raised in abundance. As yet, however, the settlers have paid but little attention to farming, being chiefly engaged in the fisheries, and in the lumber business.

The Central Wisconsin Railroad is now being constructed from Stevens Point northward, and its terminus is located on Ashland Bay, in this county.

The building of railroads to our Lake Superior harbors is attracting quite general attention, and there is probably no part of the state that holds out better inducements to the emigrant than this portion of our commonwealth.

BARRON COUNTY.

BY ORVILLE BRAYTON, BARRON.

Barron county contains twenty-five townships—from township 32 to 36 north, inclusive, and from range 10 to range 14 west, inclusive. The surface is level and gently rolling throughout. Is traversed from north to south by the Menomonee river, Vermillion river and Hay river—each of which has very abundant affluents or tributaries whereby the county is well watered.

The county was organized about three years ago, but settlements began six years ago.

In the southeast portion the soil is a rich sandy loam, the western and northwestern portions have a soil in which clay predominates—all very fertile and productive. About one quarter of the land has been entered for pine, which is mixed with hard wood, and the residue is generally covered with hard wood of the common varieties. Pine lands are generally supposed to be almost sterile—these are of strong rich soil.

Water powers are abundant. The climate is dry, and like that of Minnesota at the same latitude, with perhaps a greater fall of snow in winter.

The crops raised with greatest success are wheat, (spring and winter,) corn, potatoes, hay of all varieties, wild and cultivated rye, oats and barley.

The character of the farming is excellent; great attention is given to cattle raising; but as yet little effort is made to procure pure bloods.

Some nurseries are being opened on the shores of Chetek lake, but with what success fruit-growing may be attended time will be required to show.

In manufactures there has been nothing done except in *lumber*, and that mostly for use of settlers. A fine grist, saw and planing mill has been built and put in operation by Knapp, Stout & Co., at Rice Lake; also a large hotel and store have been recently erected by the same firm at that point. Improvements of the same character, and on a large scale have been, and are made at other points by this wealthy company, in advance somewhat, of any present paying demand, but with a purpose of encouraging the speedy settlement of the county. To this end, also, great attention is paid to opening and improving roads.

Settlers are about equally divided between native and foreign born—are thrifty and industrious. Large tracts of government land still vacant invite those in search of homesteads; perhaps the greatest inducement held out to the immigrant is the fact that here, at home, he can always find employment at the hands of the lumbering companies, to aid him to support his family while clearing his lands, and making his farm.

The county is rapidly settling up.

Great attention is paid to education. The township school system has been adopted, and teachers are provided, and school houses built, in advance of the demand. Residence in any part of this new county deprives no family of the benefits of the common school.

BAYFIELD COUNTY.

BY SAMUEL S. FIFIELD, OSCEOLA MILLS.

Bayfield county joins Ashland on the north and east. It has an area of about 800,000 acres, of which a large amount belongs to the state. The country is somewhat broken in its character,—is heavily timbered with pine

and hard wood,—has a soil of superior quality for winter and spring wheat, oats, rye, barley and vegetables, and produces grass in great abundance. It has but few acres under improvement yet, but with the building of the Lake Superior system of railroads, will be speedily developed. The great fisheries of Lake Superior are located along its lake coast and affords employment for a large number of men and considerable capital. The manufacture of lumber is also quite extensively engaged in, and is a source of great wealth to the county.

Bayfield, its county seat, is a lovely, well built village, situated upon one of the finest harbors in the world, which is the general refuge for the shipping of the lake in storms. It contains about 600 inhabitants, 8 stores, a good hotel, two large saw mills, warehouses, shops, etc. The United States Land Office and the Agency of the Chippewa Indians is also here. The *Bayfield Press* is its newspaper.

Over \$200,000 worth of fish and lumber were exported from Bayfield in 1870.

Bayfield will soon be connected by rail with the southern portion of the state, and with the Northern Pacific via its eastern extension.

Government lands are abundant, and homesteads can be found in any number within the limits of the county. All kinds of products of the soil bring good prices and find ready sale. The business of farming will pay the emigrant from the start, and the inducements to settlers are such as warrant its early settlement.

The St. Croix and Bayfield Railroad Grant, the extension of which is still, unfortunately for the state, pending in Congress, will ultimately connect Bayfield with the St. Croix Valley, and the whole railroad systems of Wisconsin and Minnesota.

BUFFALO COUNTY.

BY AUGUSTUS FINKELNBURG, FOUNTAIN CITY.

Buffalo county embraces the territory between the Trempealeau and Chippewa rivers, extending north an average of thirty miles from the Mississippi river to Pepin and Eau Claire counties. To the traveler, viewing the country from the deck of the Mississippi steamers, the bold bluffs and frowning cliffs along shore, leave only an impression of wild beauty and romantic scenery. They see nothing of the broad acres, the fine farms, the cozy homes concealed by the grand old bluffs, and hid in the beautiful valleys extending many miles inland.

The creeks and brooks emptying into the Trempealeau, fed from innumerable springs, are lined with the homes of hundreds of thrifty farmers. The Waumandee valley, extending over thirty miles inland, is a perfect garden in culture and natural beauty, and would compare favorably with any of the renowned valleys of the eastern states, not only in richness and

fertility of soil, husbandry displayed in fields and gardens, but also in the quality and costliness of the buildings, the number of schools and churches, and the intelligence of the inhabitants. The level summits of the bluffs and ridges are also crowned with continuous fields, and better soil for grain never was turned by the plow than the high table-land offers. The roughness of the exterior of our county wears down the further you leave the Mississippi behind. The bluffs become hills, and the hills decrease until you find yourself in an undulating open country, quite different in character, soil, and even in population. The territory within about twenty miles of the river is mainly settled by Germans and Scotchmen, but the towns of Gilmanton, Naples, and the northwest part of the county are principally settled by eastern families, attracted by the open country, which promised a cheerful home and speedy returns with little labor. The soil in the northeastern part of the county is remarkably varied. It is for the most part a light black loam, common to the black oak openings, but it changes from this to the richest black soil, then to a worthless sand, and again to good clay land within the same section, without and perceptible cause. Since the passage of the homestead law, every nook and corner in the valleys, within fifteen to twenty miles of the river, and the greatest part of the table-land have been entered; but many homesteads may yet be selected upon government land in the interior. The grant of lands to the Green Bay Railroad, extending over a strip of land in the Beef river valley twelve miles broad, seems to have retarded the settlement of that valley, in the northeastern part of the county. The high price, the feeling of insecurity, and the fear that their improvements will only raise the purchase price of land for themselves, has either kept settlers away, or deprived them of the energy and perseverance which are required to sustain the hardy pioneer.

Sixteen or seventeen years ago, the whole of Buffalo county was a vast wilderness, the interior known only to the Chippewa Indians. Holme's Landing and Twelve Mile Bluff, were the only points on the river known to the white man. The first, is to-day, a well built village, of some nine hundred inhabitants, known as Fountain City; the latter is named Alma, the county seat, a smart village of about six hundred inhabitants. The growth of our villages depends upon, and corresponds with the growth and development of the agricultural-interests in the interior.

Although wealth untold may be hidden in the mountains,—although iron ore is found everywhere, and washings of lead have been found in several locations, and a white metal similar to zinc has been dug out of crevices in our rocks, yet our quiet settlers have hardly looked deeper for their earnings than the plowshare or spade will expose. Of both saw and grist mills we have a goodly share, and there is no lack of water power in the interior. All our manufactured articles, necessities in a farming community, have to be imported, although their manufacture at home would be a paying business. No county could be better adapted for the manufacture of woolen goods

and agricultural implements than Buffalo—but as it is, our flocks of sheep grow less on account of the difficulty of marketing the wool—only 28,000 pounds having been raised during last year—and our timber is carried out of the county in large quantities, at a low price per cord, to be brought back, perhaps, in the shape of highly prized manufactured articles. The principal article of export is wheat; the quantity raised from June, 1869 to June, 1870, is estimated at 566,000 bushels, principally club and fife wheat. Winter wheat of excellent quality, and sought for in southern markets, is produced in sheltered locations and on new breaking. Our farmers having experimented considerably, and with no little loss of money and labor, at last have come to the conclusion that winter wheat cannot be saved from the effects of frost upon bare ground, by deep seeding, covering with straw and litter, or other theoretical manipulations, but only by a deep layer of snow, early and late, which a northerly exposure alone can secure.

The next most important article is pork. Dire experience has gradually driven the long nosed, long legged rovers out of the fences and woods, the Chester-white, or a cross breed between Chester and Suffolk, are taking their place, and six hundred pounders are now not rare. Formerly the greatest part of the pork was sent north to supply the pineries, but since the Eau Claire railroad is finished, the fatted swine are taken southward. Fountain City alone purchased during December and January last, 250,000 pounds of pork for eastern packing establishments.

The census of 1870 shows that nearly 46,000 bushels of barley was raised last year; part of this is exported; also a considerable quantity of potatoes. Formerly our farmers were very successful in raising the Pink-eye, but from some unknown cause, this variety, so much sought for in southern markets, has for years returned but poor crops—and at present the Peachblow, Davis-seedling, Chili and California are the favorites. Corn, oats and rye are raised, but more for home consumption than export.

Aside from the wheat crop, the Buffalo county farmer depends upon the sale of stock for his ready cash. I am not aware that any fine breeds of cattle have been imported, except perhaps in the northern part of the county, yet the quantity of butter and cheese sold in the market here speaks well for the common stock, ranging on the mountain sides. Our farmers, however, take much pride in their horses, and I have no doubt that Buffalo county will soon gain a reputation in this line. Some full-blooded stock-horses have been brought by the Vermont settlers into Beef river valley.

Although in latitude $44^{\circ} 30'$, yet we have succeeded well in raising fruits, especially near the Mississippi river, where the frosts appear later, and vegetation starts earlier than in the valleys of the interior.

Of apples, the Golden Russet, Early Strawberry, Red Astrachan, Fameuse and Siberian crab succeeded best; the early Richmond cherry, gooseberries, currants, strawberries are as reliable and productive as in a more

southern climate; and the limestone soil of the Mississippi bluff seems especially adapted and favorable to the grape vine. I have raised the Catawba since 1860, and the fruit has ripened every year but one; the wine has as good a flavor and is as strong as any made in Missouri, while the vines and berries seem to be more healthy and less subject to disease. For five or six years we have planted the Concord and Delaware; the Clinton is the hardiest of all, but liked less on account of its wild habits of growth; the Isabella is objected to because the berries are apt to rot immediately after they attain their full size, but all of them repay well for the labor bestowed upon them. The only precaution we take to secure them from the effects of frost, is to take them down in November, prune and cover up with earth and manure until April, when they are taken up and tied to their stakes.

The grape is the favorite fruit of the Germans, and many vineyards are started; some are in full bearing. The hopes of all our German friends is to see, in time, the beautiful bluffs of the Mississippi clad with the dark green and purple of the grape, and vie with the time-honored romantic shores of the Rhine, in beauty and wealth.

BURNETT COUNTY.

[From the State Immigration Pamphlet for 1870, with additions by S. S. FIFIELD.]

Burnett is located upon the St. Croix river and tributaries; is timbered with pine and hard wood; has an area of about 1,000,000 acres, of which 73,000 acres are state lands and a large proportion government lands, which are rapidly being taken up for the valuable timber upon them. There are grants of land by the United States government to aid in building several lines of railroads that pass through this county, which when completed will, with the St. Croix and its tributaries, give its settlers ample facilities for getting their lumber and agricultural products to market. It is settled mostly by Norwegians, and by their known industry, they will make it one of the best agricultural counties in the state.

Homesteads are still quite plenty. The proposed St. Croix and Superior Railroad is located through the center of the county, and will, when built, open up a large and valuable tract of agricultural, mineral and timbered lands.

CALUMET COUNTY.

Calumet county is one of the smallest counties in the state; it contains nine townships, with an area of about 200,000 acres. The population of the county, according to the census of 1870, is 12,334, an increase of about 4,500 since 1860. There are 62,000 acres of improved lands, the average

price of which is about twenty-five dollars per acre; the unimproved lands range in price from \$1.25 to \$10 per acre.

Although comparatively a new settled county, it has good educational, religious and social privileges. There are eleven post offices, forty-nine schools, and eleven church buildings, with mills and stores sufficient for the wants of the inhabitants. Its market privileges will soon be equal to those of any portion of the state, as there are several lines of railroads contemplated that will soon be built, which will give more direct communication with Lake Michigan; and lying on the eastern shore of Lake Winnebago, it has direct water connection with Lake Michigan.

As yet the industry of this county is mainly confined to agricultural pursuits. There are but few manufacturing establishments in operation besides grist and saw mills. The soil is fertile, and well adapted to the production of the usual farm crops. The two leading agricultural products are wheat and butter; of the first, the yield for 1870 was 332,107 bushels; of the last, 297,513 pounds were manufactured. When the county is fully settled, and its resources developed, the producing capacity of its fertile soil will be found to be equal to any county of equal area in the state.

CHIPPEWA COUNTY.

BY WM. RICHARDSON, CHIPPEWA FALLS.

Twenty years ago, when the pioneers of this county came here for the sole purpose of lumbering, they supposed that pine lands would only produce pine trees, and consequently they brought their flour, pork, corn, beans, potatoes, and in fact all the necessities of life, up the Mississippi in keel boats, from Prairie du Chien. Times are changed; now we produce both winter and spring wheat, 20 bushels per acre, which sells in Milwaukee for No 1. Our oats are No. 1; average crop 40 bushels per acre. Barley and rye grow equally as well. Hay grows wild in great abundance, and yields two tons to the acre. We also raise first quality timothy hay, two tons to the acre. As for potatoes, the world cannot surpass us in quantity or quality; the average crop is 200 bushels per acre. We have almost all kinds of wild fruits in abundance. Quite a large number of apple trees and small fruits have been set out the past season, and as apples do well fifteen miles south of us, we hope soon to raise fruit in abundance.

The stock of the county is of a good average quality, but is mostly brought from southern Wisconsin, Illinois and Iowa. The pineries make a great demand for horses and working cattle. Three hundred breaking teams were employed last summer in turning over the prairie sod. Wild land can be bought for from three to ten dollars an acre. Twenty miles from the county seat, or from the West Wisconsin Railroad, good land can be bought at government price. Improved lands are held at \$25 per acre.

The soil of the heavy, hard wood timberland is what is termed clay soil; that of the prairies is a rich, black, sandy loam. The people settled in this county are from every nation, and the door stands open to all.

In the northern part of the county, copper, silver and lead ore have been found, but not in paying quantities. We have plenty of sandstone and granite for building purposes.

Lumbering is the specialty of the county in the way of manufactures. According to the lumber inspector's report, 43,316,419 feet of lumber, 20,000,000 feet of lath and 18,000,000 shingles were manufactured in 1870. There are 1,580,480 acres of pine lands in the county, which at the present rate of consumption, 200,000,000 feet per year, will last fifty years. A large portion of our pine lands have oak, maple and ash timber scattered through it. Chippewa Falls, situated at the head of steamboat navigation on the Chippewa river, is the base of operations in the lumber region. It has the best water power in the world, and one of the largest saw mills in the United States run by water, capacity 35,000,000 feet per season. For twenty miles up the river saw mills, of a capacity of from one to fifteen million feet occur frequently. Over 200,000,000 feet of saw logs are cut and put into the river each season. This requires 2,000 men, and horses and cattle in proportion. To supply this force furnishes our farmers a good market for all they can raise. Above Chippewa Falls is a reservoir large enough to stop and hold all the logs that are cut in the winter season. The logs are held secure until the ice melts, then they are assorted and turned out as fast as required. Each owner, having his own mark, can get his own logs. The logs are run over the falls and into the several booms along the river, and as far as to the mouth of the Chippewa, where they were rafted and sold down the Mississippi.

When the lumber is sawed at our mills it is rafted in cribs 16 by 32 feet, coupled up to make rafts containing 100,000 feet. It is then run down the river by skilled pilots and hardy raftsmen to Reed's Landing on the Mississippi river, there coupled up in rafts from 300,000 feet to 2,700,000 feet; it is then sold to go down the river, at an average price of fourteen dollars per thousand, by the raft, a clear gain to mill-men of four dollars per thousand feet. The same process is repeated every year and the result has been that most of the lumbermen have accumulated large wealth.

For a new county our roads and public buildings are good. We have plenty of good school houses, and the schools are well attended. What Chippewa county needs most is capital, and skill to develop her great resources, and all are cordially invited to come and help in this great and profitable work.

CLARK COUNTY.

BY HON. G. W. KING, HUMBIRD.

Clark is one of the largest counties in the state, being thirty miles wide from east to west, and fifty-four miles long from north to south. It is well watered by the Black and Eau Claire rivers and their tributaries, and by some of the tributaries of the Chippewa river. Lumbering has been the principal business of the people in this county until within the last five years; now quite a large number are engaged in farming. There is a large amount of excellent farming land in the southern and eastern portions of the county, mostly heavily timbered with sugar maple, basswood, black and white oak, elm, black and white ash, butternut, birch and iron wood. The surface of the country in the hard timber is gently rolling, with a soil of rich, clay loam; there are very few swamps. The land is admirably adapted for the raising of winter wheat, oats, grass and vegetables. It is the best grass land I ever saw, and will in a few years be one of the best dairy counties in the state. The county is but thinly settled, but is rapidly filling up with an industrious class of men, who are not afraid of the hard work that is inevitable, where farms are cleared up in a heavily timbered country. The greater portion of the settlers are from the eastern and middle states, with a few Germans, English, Scotch and Canadians. The population of the county in 1860 was 789; at the present time it is about 4,000, the greater portion of whom have settled here in the last four or five years. There is a vast amount of good land in this county still unsettled; part of it government land, and some belongs to the state; some is owned by the Fox River Improvement Company, and some by non-residents, all of which can be bought on reasonable terms, most of it on time.

Very few counties in the west offer greater inducements to settlers than this; the climate is healthy, bilious diseases are comparatively unknown; the water is good and abundant; and the soil is unsurpassed for the production of all kinds of grain, especially winter wheat; for sixteen years I have not known a failure in the crop of winter wheat where the crop was put in, in anything like good order. We generally have good crops of corn, oats, rye and most kinds of vegetables. For a time it was thought that apple trees would not thrive here, but within the last three years, many young trees have come into bearing, and thousands more have been set out and are doing well.

The lumbermen consume all the produce of this and the adjoining counties, which makes a good home market for all we have to sell. They also give employment to every man who is able and willing to work, which is a great help to settlers who have but a small amount of capital to begin with, as it gives them plenty of work for themselves and teams in the winter, at good wages. On an average, from one hundred and fifty to two hundred

and fifty million feet of logs a year have been put into the different streams in this county, for a number of years past, and there still remains a large amount of pine to cut. There are quite a number of saw and grist mills located in the different parts of the county that are doing a prosperous business. Lumber is very cheap, and it costs comparatively but little to build here, to what it does in most of the other counties.

Many improvements have been made within the past five years. Roads have been opened in every direction, school houses have been built, villages laid out and settled. A railroad has been built, running through the southwestern part of the county, with a station at Humbird, sixteen miles from Neillsville, the county seat. Other roads and improvements are in contemplation, which promise to add much to our prosperity.

COLUMBIA COUNTY.

BY H. S. HASKELL, PORTAGE..

Columbia county is one of the inland counties of the state—Portage, its county seat, being one hundred miles from Lake Michigan, at Milwaukee, about the same distance from the Mississippi river, and seventy miles from the southern boundary of the state.

The Wisconsin, the principal river within the state, rising in the north, close up to Lake Superior, draining the great central valley of the state, enters this county at its northwest corner, and runs an almost exact south-east course for about thirty miles, to near the center of the county, where, at the celebrated "Portage," it bends at almost a right angle to the southwest, and passes out of the county at its southwest corner.

The Fox river rises in the extreme northwest corner of the county, runs a general southwestern course to within a mile and a half of the great bend of the Wisconsin, at the "Portage," where it turns abruptly to the north, and at the north line of the county turns again to the east, and with a general northeastern course for about one hundred miles, falls into lake Michigan at Green Bay. The Baraboo and Craw Fish rivers, with Duck, Roman and Lodi creeks are the principal streams in the county, and are sufficiently rapid to afford numerous small water powers for grist and saw mills,

The general surface of the county is level, yet, not flat, but sufficiently rolling to afford ample drainage. Along the Wisconsin river is some of the grandest scenery in the state. Just above Kilbourn City, at "The Dells," the whole volume of the Wisconsin river is compressed by a bold, flume-like wall of rocks, on each side, into a channel of not more than forty feet wide for a distance of several hundred yards, through which at high water it pours, thundering and foaming in way to blanch the faces of the stout-hearted raftsmen, who run the millions of feet of Wisconsin river lumber through here.

In the south central part of the county, the northern limb of Empire Prairie projects far, out like a great bay through the southern, and into the second tier of townships. In the south-east part of the county lies Fountain Prairie, and in the north-east are Welch and Portage prairies. All these prairies are fringed, deeply indented, and sometimes dotted with beautiful groves of timber and oak openings, and are, without exception beautifully rolling, of a rich, deep, friable, black, and exceedingly fertile soil. Along the Wisconsin and Baraboo rivers, on one side, or both, nearly throughout their whole length in the county, is a belt of heavy timber of several kinds of oak, basswood, elm and hickory, with some butternuts and soft maple. There are a few groves of heavy oak-timber in other parts of the county.

The remainder of the county, comprising the greater part, is covered with oak openings. Along the creeks and rivers and in low places, are excellent grassy marshes or natural meadows of sweet tender grass, affording the best pasturage, and ample opportunities for cutting an abundance of excellent wild hay.

The surface of the burr oak openings is rolling and undulating, and differs from the prairies in no respect except that the soil of the latter seems a little more loose and friable. In the other oak openings the soil is poorer; the white oak being generally clayey, and the red and black oak inclined to sand.

The crops generally grown are wheat, Indian corn, oats, rye, barley and potatoes. During the late hop mania, many farmers and many men who were not farmers, tried their hands at raising hops to their sorrow; but the hop yards are now rapidly disappearing before the plow-share. Wheat is the great staple crop of the county and is generally grown successfully and profitably; although not on so large a scale as in some parts of the western country, yet there are many farmers in the county who raise yearly from one hundred to five hundred acres, and whose garner are annually well filled.

Spring wheat is the kind generally raised. But little winter wheat is sown on account of the great liability to winter kill. The quality of this cereal grown is superior, especially that raised on the lighter openings, in the central and northern portions of the county.

Indian corn, of both dent and flint varieties, can be raised any where in the county, when the farmer will take pains to properly prepare and plant his land, and cultivate his crop.

Potatoes are raised successfully in all parts of the county. The quality of those raised in the light sandy soils along the Wisconsin river, and the lighter soils of the county, can't be beat in the United States. This is also true with all garden vegetables. They grow remarkably quick, and of an excellent quality, and can be matured in the vicinity of Portage, and in the valley of the Wisconsin, at least two weeks earlier than on the shore of Lake Michigan at Milwaukee.

Very great improvement in cultivation has been made by the farmers in the county generally in the past four years. The slip-shod, free and easy style of farming, so prevalent not many years since, has given place to a more careful and thorough cultivation. More system prevails. The best modern, improved farm implements are extensively used, and the fields present a cleaner, better appearance by far than they once did. Tasty farm houses, and substantial barns and out-buildings, surrounded with thrifty gardens and orchards, are seen on every side.

With general improvement in other things, there has also been an improvement of the stock. The ungainly mongrels that were wont to serve as a substitute for cattle, are fast being supplanted by the neat, trim, Durham and Devon. There are now some splendid herds of these cattle in the county. The same is true of hogs, horses and sheep. Pork, with our farmers is a great staple, and great pains are taken to get the best improved breed of hogs.

Improvement of the flocks of sheep has received its due share of attention. Importations of some of the best Vermont bucks and ewes have been made, and wool-growing has become a pleasant and profitable branch of agriculture.

Apples head the list of our fruits. We now raise very nearly, or quite enough for our own consumption, and the quality, both in size, fairness and flavor, is very superior. We have had several discouraging pull-backs, by way of hard winters, troublesome insects, etc.; but in spite of these our fruit-growers have persevered; trees that were winter-killed have been replenished by others more hardy—enemies have been met and conquered, and now young bearing orchards are to be seen all over the county. There are several orchards that yield annually from five hundred to a thousand bushels each.

Pears are raised by the amateur only, but can, in many parts of the county, be raised as successfully as apples. On our sandy loam about Portage, some most splendid Bartletts, Flemish Beauties, Belle Lucrative are raised,

Plums are natives of all the groves and thickets in the county, and are produced in the greatest abundance, and many of the best varieties of the cultivated plums are raised in all parts of the county.

Small fruits are everywhere raised in abundance. Cranberries grow wild in many marshes, and some of our enterprising citizens are endeavoring to improve and extend these fields by cultivation. Grapes are cultivated all over the country. They, however, need winter protection, and where this is given, and the vines properly pruned in the fall, they yield abundantly every year. The lighter soils and the limestone, gravelly bluffs along the Wisconsin river are better adapted for raising grapes than the heavier, richer soils of the county.

The manufacturing interests of the county are not yet much developed. There are several small water powers, on which are grist mills sufficient for

the custom work of the county. Leather is manufactured to some extent at Portage and some other points in the county. There are a few wagon shops, where all kinds of wagons and carriages are made. At Cambria there is a woolen factory, where, on a small scale, excellent woolen cloths and shawls are made.

Running through the southeasterly part of the county is a high ridge, or great swell of land, which seems to be of a different geological formation from that of the surrounding country, and to have been forced up through the supervening strata by some great convulsion of nature. Along this ridge specimens of several kinds of ores have been found, but not in paying quantities. Drift metal, of copper and lead has often been found, all over the county. Specimens of pure, native copper, often of many pounds weight, have been ploughed up in fields on the prairies and elsewhere.

The great geographical feature of the county, that which will be eventually of more benefit than anything else, is the peculiar position of the Fox and Wisconsin rivers to each other, that makes possible a ship canal, to unite the waters of Lake Michigan and the Mississippi rivers. At "The Portage," a name given by the early French voyageurs, where now stands the city of Portage, they approach so near together that, in high water, the waters of the Wisconsin are wont to flow across the intervening flats into the Fox. Boats of considerable draft had floated across from time to time before any canal was dug. Several years ago a canal about two miles long was dug, with a lock at the Wisconsin river, and another at the Fox, which at that point is some six feet lower than the Wisconsin, and the channel of the Fox dredged in places, and somewhat straightened, and a successful navigation from Green Bay was commenced. A considerable amount of business has for years been done through this channel. But of late the rapid development of the northwest, and the want of facilities for cheaper transportation of their surplus produce to market, has turned the attention of the people of several states to the route, and Congress has taken the initiatory steps to open through here a ship canal.

The main line of the Milwaukee and St. Paul Railroad passes through this county from Columbus to Kilbourn City, and the north division of the same railroad unites Randolph Station with the main line. Besides these the Madison and Portage, and the Madison and St. Paul roads pass through the county; these taken in conjunction with the navigation of the Fox and Wisconsin rivers will make all parts of our county easily accessible to market, and give us facilities equalled by few, and surpassed by none of the counties of the state.

In the internal improvements of our county are seen abundant indications of the enterprise, good taste and prosperity of our citizens. The roads in all parts of the county are good; a large number of first-class farm houses and private residences are seen everywhere; our schools are good, school-houses neat and attractive; our church edifices are numerous and are respectable in size and appearance; the county buildings are large,

convenient and well adapted to the purposes for which they are designed. At Wyocena the county has erected, as an adjunct to the poor house, an asylum for those insane persons for whom the state has not made sufficient provision. The building is of brick, cost six thousand dollars, and will accommodate thirty patients; it is well patronized, and is one of the most beneficent institutions of the county.

Our agricultural society is in an active, prosperous condition; there seems to be a growing interest on the part of our farmers in the society, so that now it has come to be considered the institution of the county, and is working a very perceptible good.

The population of the county is about 30,000, and is made up of settlers from all parts of the Union and the old world. Those from New England and New York predominate. To sum up all, we regard Columbia county as one of the model counties of the state, both considering its geographical position, its physical features, its agricultural, social and financial advantages, and the intelligence and enterprise of its inhabitants.

CRAWFORD COUNTY.

BY WALDO BROWN, PRAIRIE DU CHIEN.

This county, which originally embraced a large portion of western Wisconsin, is now composed of about five hundred and sixty square miles, near the southwest corner of the state, and north of the junction of the Wisconsin and Mississippi rivers, the former being the southern, and the latter the western boundary. The population of the county by the census of 1870 was 13,177.

Among the striking features of its topography, are the towering bluffs, which often rise to the height of from four to six hundred feet, and which present their bold, rocky fronts on the whole line of river boundary, as well as along either bank of the principal streams. The bottom lands lying at the foot of these bluffs are very fertile, and the soil, which is a light, sandy loam, is of great value for the production of garden vegetables of every description, which come to maturity much sooner than on the high lands in the same localities.

Through this county, near its center, runs a divide, which separates the valley of the Mississippi from those of the Wisconsin and Kickapoo rivers, and from this, at right angles with it, are alternations of ridge and valley, the former generally wooded, while in the vales are fertile lands, valuable forests, prairie meadows, and good water-powers, on never-failing streams.

This peculiar formation gives the county the appearance of being rough and broken; and so it is, yet its soil, not only on the bottom lands but on the ridges, is rich and productive to such an extent that the husbandman

reaps here as rich rewards for his labor as do those who have sought homes on distant prairies.

The soil of the high lands is a light sandy clay, easy of tillage, and is celebrated for producing the finest qualities of wheat, while the yield is about the same as on the prairies. It is equally well adapted to corn, oats, grass, barley and buckwheat, while for potatoes and other root crops it is of superior quality. These natural advantages were overlooked by immigrants for many years, but the fact that during the last decade our farming population has almost doubled, proves that our lands and agricultural facilities are appreciated, and that in the future they will be sought more and more, not only by our own countrymen, but by immigrants from foreign lands.

There is no county in the state better adapted to fruit growing than is this, the soil seeming to possess the requisite elements in the right proportions for healthy growth and prolific fruitage. Fruit is rarely killed by frosts, and trees and shrubbery are less affected by disease, climatic changes and vermin than in other less favored localities.

The practicability of apple culture is fully demonstrated, careful and observant nurserymen having discovered after years of experiment the varieties best suited to this soil and climate. Thousands of acres of the hills of this county should at once be planted with apple orchards and vineyards, whose products in a few years would far exceed those of all its grain fields. Besides the apple, there is an abundance of wild fruits; and currants, gooseberries, raspberries, blackberries, strawberries, grapes, etc., have a rapid growth and rarely fail to produce well.

But little attention has yet been given to the rearing of imported or blooded stock, but the organization during the last year of the Crawford County Agricultural Society has excited a new interest in this direction, and a generous rivalry among stock growers; and in the future we shall not be behind our neighbors in this, one of the most important and profitable industries of the country. The interest in that society will also stimulate to a higher order of agriculture, and to greater system and perfection in workmanship, not only on the farm, but in the shop and factory.

Lead and copper ores have been discovered, and there are indications of the existence of heavy bodies of those minerals, but none have yet been found which would pay for working. Extensive quarries of excellent building stone are found in every town in the county, and from the bluffs on the Wisconsin river large quantities are taken each year and shipped to the east. The best stone in the beautiful capitol building at Madison are from this quarry.

Agriculture and trade have hitherto been the pursuits of the people to the almost entire neglect of manufactures, the census of 1870 showing an aggregate of farm production of \$823,000, while the product of our manufactures was but \$240,000. But during the past year the people have awakened to the importance of manufactures to all other branches of industry, and henceforth the hammer, loom and anvil are to have their devotees as

well as the plow. Encouragements to the investment of capital in such enterprises are now held out, extensive establishments are contemplated, and these at an early day will make of Prairie du Chien one of the most prosperous and growing towns in the state. That place, aside from its natural beauty and historical associations, has every advantage which could come from almost unequaled facilities for shipments in all directions, from proximity to heavy bodies of fine timber, from railroad connections with the Iowa coal fields which will soon be completed; and these causes combined with others will result in this place becoming one of our principal manufacturing towns. There is no better location in the state for manufactories of all kinds; and all would find customers for their wares near at home.

In the line of public improvements, are excellent roads and good school houses, so numerous that every child enjoys the privilege of a good common school education.

An elegant court house and jail was erected at Prairie du Chien in 1869 at a cost of 25,000 dollars.

The Milwaukee and St. Paul railway extends along the southern line of the county for a distance of twenty miles. Bridgeport is one of the principal shipping points on the road for grain and live stock, while at Prairie du Chien the company have one of the largest freight depots in the state, a grain elevator with a capacity of 250,000 bushels, and from which 275 cars have been loaded with wheat in a single day. The company have here large car works, a good passenger depot, and near this one of the finest hotels in the West. The business of the company has increased so rapidly under its excellent management, that it has been compelled to erect a temporary bridge over the Mississippi for the transfer of trains during the winter, while in the season of navigation, in 1870, three steamers were constantly engaged in the transfer of cars from one shore to the other.

Second to no other enterprise affecting the welfare of this county, is the scheme for the improvement of the Fox and Wisconsin rivers, over which Marquette and his little company sailed nearly two hundred years ago on a voyage in search of the "Father of Rivers," and whose success was a prophecy of this future Erie canal of the west. Cheaper transportation for western produce to the seaboard has become a necessity, and while the completion of the work will add millions to the wealth of the west, it will make within the limits of this county a city which shall bear to another upon the lakes, the same relations that Buffalo does to New York. That city will be Prairie du Chien. With the dawning of that day will come to Crawford county an increase in wealth, population and the value of its lands of which her people have hardly dreamed as yet.

The commerce of the county at this time has an extent and importance which few would imagine who have not examined the figures which show it; and this is not conducted by rail alone, but three organized lines of elegant steamers touch at our river towns, and do not only a large freight but passenger business also.

We submit a few items of the shipments by rail from Prairie du Chien during 1869, not as indicating the production of the county but rather its commercial transactions :

Wheat, bushels	4, 851, 875
Barley, bushels.....	75, 429
Oats, bushels.....	83, 175
Flour, barrels	478, 432
Dressed hogs, number	40, 630
Live cattle, number.....	2, 836
Live hogs, number.....	16, 268
Wool, pounds	276, 540
Butter, pounds	1, 145, 710
Hides, pounds.....	<u>2, 027, 430</u>

And the aggregate of shipments in pounds for that year amounted to 416,687,720 pounds. Heavy shipments of grain were also made from other stations and from river towns.

The county is remarkably healthy, is well watered, has heavy forests in every town; in her markets, lumber and all descriptions of building material are plenty and cheap. Improved lands may be purchased at from fifteen to thirty dollars per acre, and unimproved from five to ten dollars.

The public schools are under the charge of good teachers and an efficient county superintendent, and are accessible to nearly every child. In Prairie du Chien is a large German school with an accomplished native teacher, while the Catholics have a large "Sisters" school, and will soon open another of a higher grade in a large and beautiful building which was erected at a cost of 50,000 dollars.

The people of Crawford county are intelligent, industrious, wide awake to their interests, and hence are good patrons of schools, churches and their press, and taken all in all, the county possesses the natural, and other advantages which in future will permit her to take a front rank among those which make up the noble commonwealth of Wisconsin.

DANE COUNTY.

[From the State Immigration pamphlet for 1870.]

Dane county is situated midway between Lake Michigan and the Mississippi river; its southern boundary being twenty-four miles north of the south line of the state. It is bounded on the north by Columbia and Sauk counties, on the east by Dodge and Jefferson, on the south by Rock and Green, and on the west and northwest by Iowa and the Wisconsin river. Its extent is forty-two miles from east to west and thirty-five miles from north to south, containing thirty-five townships, or one thousand two hundred and thirty-five miles, or 790,400 acres of land.

Madison city, the county seat and the capital of the state, has one of the most beautiful locations in the world, in the midst of charming lakes. Here

is the new capitol building, which, surrounded by a commodious and elegant park, presents an impressive appearance of taste and beauty; and among the other substantial buildings are the United States postoffice, city hall and the court house. The state university buildings and university farm occupy an elevated and pleasant site about one mile west of the capitol. There are thirty-five towns and fourteen villages in the county. Six of the towns are largely settled with Norwegians, and six by Germans, and the American and European nationalities are more or less represented in all of the towns.

The county is throughout well watered by lakes and streams, and the soil is generally fertile; in some parts extensive prairies prevailing, and in others undulating and hilly land. Timber is plentifully interspersed throughout the county.

The public land in the county is all taken up, and the wild land remaining can only be got from speculators and others.

It has a larger area of cultivated land (395,703 acres) than any other county, and produces the largest crop (2,730,130 bushels in 1869) of Wisconsin's staple wheat, as well as large crops of other kinds.

Stock raising receives much attention, and pure-blooded animals are being introduced.

Fruits of nearly every sort grown in this latitude are produced in abundance.

Manufactures have increased in number and variety since 1860.

There are numerous churches of all denominations throughout the county, also public and private schools.

The Milwaukee and St. Paul, the Chicago and Northwestern, and Madison and Portage railroads have brought it into direct connection with all parts of the state and country.

DODGE COUNTY.

BY E. B. BOLENS, ESQ., JUNEAU.

[From the State Immigration pamphlet for 1870.]

The county is located in the southeast part of the state, being the third county from Lake Michigan, as also from the south line of the state. It embraces twenty-five congressional townships, from which three pretty large lakes must be deducted to give the area of arable land. These townships are designated on the official survey as townships 9, 10, 11, 12 and 13, north, of ranges 13, 14, 15, 16 and 17, east. The soil is a rich, alluvial black loam, in some towns with a clay subsoil, in others sand. The east half of the county is well timbered, principally oak and hard maple. In township 11, of range 16, (Hubbard), is a very valuable iron mine, now owned and worked

by the Milwaukee and Chicago Iron Companies. There are three lakes of considerable size in the county, the largest being Lake Horicon, which covers large portions of townships 12 and 13, of ranges 15 and 16, and small portions of other towns. The next lake in size is Beaver Lake, located in townships 11 and 12, of ranges 13 and 14, and the next is Fox Lake, located in township 13, of range 12. These lakes furnish an abundance of fresh fish of the best quality, the waters being clear and pure, and affording refuge also for millions of wild game, such as ducks and geese. The county is well supplied with streams, the largest being Rock river, which flows into Lake Horicon from the east, and passing through the lake emerges at the south end, running thence almost due south through the center of the county. It affords several water powers of great value. The next largest is Beaver, which runs from Beaver Lake in a southerly direction through townships 9, 10 and 11, of range 14, affording good water powers. There are many other rivers and creeks, some of which afford mill privileges. The water in all parts of the county is good and easy of access. The county is divided into twenty-four civil towns. The largest city, located wholly in the county, is Beaver Dam, situated at the south end of Beaver Lake. It is a city of about 6,000 inhabitants, possessing several large flouring mills and factories, run by the waters of the lake which forms the head-off of Beaver river. The other cities and villages, of which there are nearly twenty, range from 200 to 3,000 in population, and all possess advantages as trading and market towns.

The county is well supplied with wagon roads, which cross each other in every direction, affording easy means of going to every part of the county. Over all the streams crossed by the roads are strong, and convenient bridges.

There are four lines of railroad now in operation, and a fifth one will soon be finished. The Chicago and Northwestern passes through the center of the county, from north to south. The La Crosse Division of the Milwaukee and St. Paul road passes through the southwest part of the county. The Northern Division passes through the county from east to west, crossing the Chicago and Northwestern road near the center of the county. Another branch of the same road starts from Horicon and passes through the towns of Burnett and Chester. The fifth road, soon to be finished, starts from Iron Ridge, where it connects with the Milwaukee and St. Paul road, and connects at Fond du Lac with two other roads.

Territorially, Dodge is a large county, very fertile and well situated. In population it ranks third in the State, Milwaukee and Dane counties only having a larger population. In 1860 the United States census showed the population to be 44,499. The census of 1870 gave a population of 47,140.

The inhabitants are industrious, intelligent and frugal. The east half of the county is mostly settled by Germans. The other towns are also largely settled with Germans, which element is nearly equal to all other nationalities in the county. The towns of Emmet, Shields, Clyman, Elba and Port-

land are mainly settled by Irish. The other towns are mixed in population, the preponderance of "Yankees" being in the northwest part of the county, in the towns of Fox Lake, Trenton, Chester and Burnett. The town of Calamus is largely settled with Welsh, and the town of Ashippun by Scandinavians.

The wealth of Dodge county is equal to any in the state except those embracing the large cities. Mineralogically, it is distinguished by its extensive and valuable deposits of iron. Iron Ridge mine has been known and worked for years, still the capital of the company owning it was so limited that its real extent and value has never been fully realized, until the present owners took it. It was formerly owned by the Sweed's Iron Company, who, in the fall of 1869, conveyed its interests to the Milwaukee Iron Company of Wisconsin, the North Chicago Rolling Mills Company of Illinois, and the Wyandotte Rolling Mills Company of Michigan. The property conveyed comprises nearly 600 acres of land in sections one, twelve, thirteen and sixteen of township eleven, range sixteen, and section twenty-six in township twelve, range sixteen, and comprises the southern point of the ridge. Beside the land, the purchase included the railway from the mine to the Milwaukee and St. Paul road, furnaces, etc., for the whole of which \$500,000 were paid.

The extent of ore is immense. So little has been said about it that the people of the west do not know what its importance really is. The ridge, or rather two ridges, rise perpendicularly about fifty feet, at the south end, and runs almost due north about thirty miles, or nearly to the city of Fond du Lac. The south end, however, is the only part positively known to contain ore, but it is now supposed that the whole ridge is enriched with it, the ore dipping very fast, probably, as you go north.

The schools in every town, village and city in the county, are well organized, liberally provided for, as to pay, school houses, libraries, etc. The churches are numerous. Milling privileges are good. In short, Dodge county is one of the best for settlers in the older parts of Wisconsin, especially for agricultural pursuits. Land is for sale at from \$5 to \$50 per acre in all parts of the county.

DOOR COUNTY.

[From the State Immigration pamphlet for 1870]

Door county is situated in the northeastern part of the state of Wisconsin, and between lake Michigan and Green Bay, is seventy miles in length with an average width of about ten miles. Lake Michigan, one of the great fresh water lakes of North America, lies on the eastern side of it, and Green Bay, an arm of it, on the west side. The proximity of the lake is in many respects valuable, and its influence on the atmosphere equalizing and beneficial.

The land in the county is timbered with maple, beech, elm, oak, iron-wood, birch, basswood, pine, hemlock, tamarack, cedar, spruce, balsam and other varieties of timber common to this part of North America. The soil is generally a clay loam, interspersed occasionally with soils more or less mixed with sand. Scattered through the county is a large portion of rich bottom lands, of alluvial deposits, with an average depth of six feet, of the richest black soil. On the uplands the average depth of the soil is ten feet, resting on a foundation of limestone rock. The land is well watered throughout the county by numerous small creeks, and springs of pure living water are abundant. The surface of the county is gently rolling and well adapted to farming purposes.

In the county are 58,000 acres of wild lands owned by the state, which will be sold in quantities to suit purchasers, at an average rate of one dollar per acre. These lands embrace some of the richest in the county, and when cleared of the timber, will make some of the finest farming lands in the country. Of land owned by the United States, there are about 3,000 acres that can be entered under the Homestead Law, which gives to every man for \$10, 160 acres of land on condition that he will live on and improve it.

Wheat, rye, oats, barley, buckwheat, corn and other grains, and potatoes, turnips, beets, and all the root crops and hay are grown in the county, and yield rich returns to the farmers. Some of the best wheat land in the state is located in this county. All of the grains mentioned are a sure crop. Fruit, such as apples, pears, plums, crab apples, grapes, currants, blackberries, raspberries, gooseberries and other varieties grow in profusion, and, when properly cultivated, yield large crops. The position of this county, between two large bodies of water, is peculiarly favorable to fruit, and many thriving orchards in the county bear witness to its facilities for fruit growing.

There are ample school facilities in this county; each settlement having a school house in close proximity, and there are Protestant and Roman Catholic churches. The roads in the county, and the facilities for getting them are good.

A large number of the inhabitants of the county are engaged in cutting their timber into cord-wood, saw logs, railroad ties, telegraph poles, fence posts, &c., for which a ready sale is found. Many farmers devote their winters to this work, clearing up their farms and selling the timber thus cut down.

The large bodies of water on each side of the peninsula abound with fish, and furnish employment to a large number of men in catching them, Trout and whitfish are caught in large quantities, salted and sold at remunerative prices.

The population of the county is between 5,000 and 6,000, and embraces almost all European nationalities. Belgian, German, Norwegian, French, Irish, Dane, Dutch, Swede, English, and people of other nationalities, have come

here and cleared up fine farms in the woods for themselves. After making themselves comfortable homes, they have sent back across the ocean for their relatives and friends to come and share with them the prosperity offered to every willing heart and strong hand here.

At the present time there are upwards of 18,000 acres of land improved and under cultivation in the county, giving forth yearly their bounteous harvests filling the granaries and barns to overflowing with the various articles of farm produce that flourish so luxuriantly in the fertile soil. Substantial houses, comfortable barns and stables, churches, school houses, stores, saw mills, shops and roads give evidence of the prosperity of the people and of the success which has attended them in their efforts to carve out a home and a competence in the virgin forests of Door county.

DOUGLAS COUNTY.

BY JAMES S. RITCHIE, SUPERIOR CITY.

This county is situated in the northwest part of the state, at the head of Lake Superior, and contains within its boundaries every variety of soil, timber and minerals to be found in the Lake Superior region. It is well watered by numerous streams flowing into the lake, and the St. Croix river. In the vicinity of all these streams, alluvial bottoms of the best quality for farming purposes, offer rare inducements for settlers.

Upon these lands the wild hop, of an excellent quality, grows spontaneously; wild plums, currants of several species, gooseberries, raspberries, etc., grow in abundance. Almost every township possesses several varieties of soil suitable for grass and wheat lands, and is now open for pre-emption or homesteads by settlers at government prices. White and yellow pine, hemlock, sugar and birds-eye maple, white cedar, tamarack, birch and oak are abundant. These constitute no small portion of the wealth of this county. Almost every acre of land contains timber enough to more than pay for its cultivation.

The lumber trade of Douglas county is the principal branch of business at present. A large amount of dressed lumber, shingles, lath, etc., are annually exported to Duluth, Minnesota and the mining towns of Lake Superior.

Lake Superior abounds with the most delicious fresh water fish known. The flavor of its trout and white fish is much superior to that of the lower lakes. Every good-sized stream near Superior City abounds with the finest quality of delicious speckled or brook trout. The demand for Lake Superior trout, white fish, liscomet, both fresh and salt, is very great.

An important trade in furs, etc., is conducted at Superior City, with the Indians of Lake Superior.

It is impossible to give a correct idea of the amount of the different kinds of ore to be found in the county. Copper abounds in the mineral ranges which extend through a considerable portion of the county to the

shores of Lake Superior. The specimens of copper found are of the richest quality, and miners who have examined the veins which abound in the mineral range are of opinion that there are heavy deposits in the ground that would require but a small amount of capital to reach. The appearance of the country and the surface veins is very similar to the copper regions of Ontonagon and Portage Lake on Lake Superior. There is also vast deposits of iron ore in Douglas county, unavailable at present owing to the want of railroad facilities. Large quarries of excellent building stone are found in this vicinity, both granite and red sandstone, and a good quality of brick have been manufactured from the clay.

Our agricultural products, particularly winter wheat, rye, oats, barley, potatoes, peas, etc., and flowers, cannot be surpassed. This is eminently a grass country; timothy, clover, blue joint, red top and natural grasses thrive in this climate. Vegetables grow to an astonishing size, particularly cabbage, cauliflowers, potatoes, beets, radishes, etc.

A healthier region (says the celebrated Dr. OWEN) does not exist; here the common diseases of mankind are comparatively unknown. The lightness of the atmosphere has a most invigorating effect upon the spirits. The purity of the atmosphere makes it peculiarly adapted to all those afflicted with pulmonary complaints, and such a thing as consumption produced by the climate is wholly unknown. Fever and ague, that terrible scourge of Illinois, Indiana and Kansas, is rapidly driven away before the pure and refreshing breezes which come from the northwest.

The winter season is the most agreeable part of the year, In lake Superior winters we have plenty of blue sky, fine bracing atmosphere, and very little rain from the month of November until April. In this region less snow falls than in either of the New England states, or northern New York.

Superior, the county seat of Douglas county, is situated on the Bay of Superior and Nemadji river, at the head of lake Superior. It possess a better site, a better harbor and greater natural advantages for a commercial city than any other port in the northwest. Its harbor, the largest on the lake, is formed by a narrow strip of land over six miles in length, stretching out from the Minnesota shore and thrown up by the action of the waters of the lake and those of the St. Louis river. This capacious land-locked harbor is called the bay of Superior.

The situation of Superior corresponds with that of Chicago, in being the chief port at the head of navigation of a great lake, and the point where the Northern Pacific and other railroads from the interior of state will terminate.

The population of Superior is about twelve hundred; it is composed of persons from all parts of our own country and from almost every clime of Europe. One graded high school and three public schools under the charge of experienced teachers offer rare facilities to those desirous of giving a good education to their children. The public buildings consist of a large court-house with capacious vaults and offices for the county officials situated in a commanding position in court house square. The government

has been for several years past improving the entrance of the harbor by confining the waters of the St. Louis and Nemadji rivers to a narrow channel by means of cribs loaded with stone. By act of Congress, and by the state legislature, Superior is fixed as the terminus of several important land grant railroads now in process of construction.

DUNN COUNTY.

BY JOHN H. KNAPP, MENOMONEE.

At the time of taking the census, in 1870, the population of this county was 9,491; nearly three-fourths of which settled here within the past ten years. Considering it is one of the new counties in the northwestern part of the state, the progress in settlement, and in development of its agricultural resources is almost magical.

The county is nearly equally divided between open prairie country in the eastern half, having a fertile, sandy loam for soil, and heavy timbered land in the western half, with maple, oak, ash, butternut, basswood, etc., with a soil of rich clay loam.

The principal cereals raised are wheat, oats, barley, rye and Indian corn. The statistics collected early in 1870, which, of course, show only the amount raised the previous year, give as the product of 1869, in round numbers:

Number of bushels of wheat	209,000
oats	262,000
barley	26,000
corn	73,000
rye	10,000
Number of pounds of butter	204,000
tons of hay	12,000
pounds of hops	7,900

The root crops are usually large and of excellent quality, but owing to the ravages of the potato bug, the potato crop in 1869 was only 55,000 bushels.

In many parts of this county wild fruits, such as whortleberries, blackberries, raspberries, strawberries and plums are abundant. There has been but little attention given to propagating tame fruits; sufficient, however, has been done to prove that hardy apples, such as the Duchess of Oldenburg, Tetofsky and the crabs, known as the Transcendent, Hislop and Siberian, yield abundantly, and are hardy and well adapted to this latitude.

Grapes do well also, particularly the Concord, Dracut, Amber, Delaware, Clinton, Hartford Prolific and Rogers' Hybrids Nos. 15 and 19.

Cattle, horses, sheep and hogs prove profitable stock here, but there are no particular breeds raised deserving of special notice.

The chief manufacturing business is that of lumber, of which, during the

year 1870, there was manufactured in this county, besides a considerable amount of pickets, staves, etc.: boards and plank, 65,000,000; shingles, 16,000,000; laths, 10,000,000.

There are several flouring mills in the county, and as near as can be ascertained, there were 200,000 bushels of grain of all kinds ground during the past year.

The public schools are good, of which there are sixty-four now open and giving instruction to 2,593 pupils.

The court house now in process of erection in the shire town, Menomonee, is of a character that will do credit to the county and will cost when completed, about thirty-five thousand dollars.

EAU CLAIRE COUNTY.

BY HON. J. G. THORP, EAU CLAIRE.

The following statistics, compiled from reliable sources, convey but a faint idea of the position this county must soon assume in its productive capacity. The recent introduction of a railroad (West Wisconsin,) in direct communication with the main highways of the state, has done and will do more to induce immigration, advertise its resources and develop its industry in a few years, than has been accomplished by the patient plodding of sixteen years. Its inland and isolated position, and the difficulty of reaching a reliable market have proved serious obstacles to development.

Of late years a large home market has been created. The demand for the products of the farmer required for logging, lumbering and manufacturing purposes generally within its own borders, has given a very marked impetus to this branch of industry. And with the prospect of a yearly increase in this direction, and the facilities afforded for reaching eastern markets the farmer may congratulate himself that his prospects favorably compare with those of any other section of the state:

	Acres.	Real values.*
Number of acres in county.....	414,720	.....
owned.....	199,407	\$1,757,454
improved.....	34,973	.....
Wild lands capable of tillage unowned.....	80,000	.....
Real estate in villages.....	.....	1,637,370
Live stock over two years old—		
Number of horses.....	1,959	269,384
neat cattle.....	4,711	143,942
mules and asses.....	75	11,200
sheep.....	2,228	5,386
swine.....	2,056	18,062
Number of wagons, carriages and sleighs.....	1,026	66,348
pianos and melodeons.....	66	13,290
watches.....	155	6,640
Merchants' and manufacturers' stock.....	.....	502,900
All other personal property.....	.....	292,560

* Taken from assessment roll and doubled in order to show the real values.

Agricultural productions—Census returns of 1870.

Number of bushels of wheat.....	208,241
oats	286,534
corn.....	67,257
rye.....	4,228
barley	22,185
potatoes.....	28,779
Number of tons of hay.....	5,721
Number of pounds of butter.....	124,285
wool	5,015
hops	4,600
Estimated value of above productions.....	<u>\$456,620</u>

The great staple manufacture of the county is lumber. The vast pineries of the Chippewa and the Eau Claire annually yield for manufacturing purposes in this county alone, from seventy-five to eighty-five million feet, and when it is remembered that at least one-sixth of the pine in the United States is embraced in the two pineries named, the importance of this product can be readily seen.

Manufactured productions—Census returns of 1870.

	Values.
9 grist and flouring mills, annual earnings.....	\$63,345
21 saw mills, annual production	927,080
2 shingle mills, annual production.....	14,385
4 sash and door factories, annual production.....	32,800
3 foundries.....do.....do.....	40,500
4 furniture shops.....do.....do.....	13,300
7 wagon and carriage shops,do.....do.....	14,200
10 blacksmith shops.....do.....do.....	18,500
2 joiners shops.....do.....do.....	1,000
3 cooper shops.....do.....do.....	3,700
10 boot and shoe shops.....do.....do.....	17,280
5 tailor shops.....do.....do.....	6,500
5 harness shops.....do.....do.....	5,726
3 jeweler's shops.....do.....do.....	3,400
1 pottery	500
5 photograph galleries.....do.....do.....	7,800
2 bakeries.....do.....do.....	3,640
2 book binderies.....do.....do.....	1,700
1 carpet weaving.....do.....do.....	500
2 paint shops.....do.....do.....	2,700
5 milliners shops.....do.....do.....	5,700
1 tin shop	2,500
1 fanning mill factory	2,500
1 pump factory.....do.....do.....	2,400
3 printing offices.....do.....do.....	13,000
4 brick yards.....do.....do.....	17,400
1 artificial stone factory.....do.....do.....	700
4 breweries.....do.....do.....	18,808
Total	<u>\$1,231,564</u>

RECAPITULATION IN PART.

Value of real estate owned.....	\$3,395,184
Value of personal property.....	1,329,712
Value of agricultural productions.....	456,620
Value of manufactured productions.....	1,231,564
	<u>\$6,413,080</u>

FOND DU LAC COUNTY.

BY G. DE NEVEU, FOND DU LAC.

The county of Fond du Lac includes within its limits twenty-one towns, which, deducting the area covered by the southern end of Lake Winnebago and other lakes, are equivalent to twenty townships of thirty-six sections of solid land. In its natural state it was very equally divided into three parts of prairie, oak-openings or light timber, having from three to fifteen trees to the acre, and heavily timbered land covered with maple, oak, basswood, elm, ash, iron-wood, etc.; the whole so admirably intermixed that hardly any place within the limits of the county was more than two or three miles distant from timber. Generally speaking, the western portion of the county includes the prairie, and the eastern the timber land; the central portion being a sort of compromise between the two, viz: small prairies dotted all over by fine groves of oak and other timber. The soil is eminently fertile, as, indeed, is that of our state generally, with, perhaps, the exception of the pine country of the north.

The surface of the county in the western and central portions is gently undulating, seldom rising higher than one hundred feet above the level of Lake Winnebago, with a general average of about seventy feet. Along the eastern shore of that lake, about three-quarters of a mile distant, and running parallel to that shore, exists an abrupt ledge of lime-stone running in a general north and south direction, through the towns of Calumet, Taycheedah and Empire, where it ends, to begin again in a south-westerly direction through the town of Eden, Byron and Oakfield, where it passes into Dodge county. That ledge appears to have been, in ancient times, the eastern and southern boundary of a vast lake, of which lakes Winnebago, Butte des Morts, Pawegan, Green, Rush and other lakes are now the remnants; consequently the soil of that basin is of a rich alluvial character. The narrow belt included between Lake Winnebago and the ledge is superior to any other portion of the county for the production of fruit, owing to the modifying influence of the water against early and late frosts, and excessive drought in summer.

The limestone ledge is a striking feature in the scenery of this section, which, though lovely, would appear rather tame and monotonous without

it; it relieves the landscape by its bold, perpendicular cliffs, that in places rises to the height of a hundred feet and affords prospects from its summit which it would be hard to match, for loveliness and extent, in the western states or, indeed, anywhere. When wealth accumulates, as it is sure to do, and, indeed, is fast doing, in this favored section, these beautiful uplands will be eagerly sought for the residences of the wealthy men doing business in the city of Fond du Lac, the average distances from the top of the ridge being not more than four miles.

This ledge deserves more than a passing notice on several accounts: It not only supplies the county with materials for superior lime and building stone; but it also furnishes the most beautiful and true flag-stones, of any desired thickness, from one-half inch up to five or six inches; so true, indeed, that a carpenter's rule will bear on its entire length in any direction. The supply of these is absolutely unlimited. There is enough to supply a continent at low rates. About twenty quarries are worked along the ledge, and the business in stone and lime is not less than \$20,000 per year. Eventually the city of Fond du Lac will mainly be built of stone, as it is the cheapest and safest, as well as most durable material. The fronts of the finest stores and business blocks are built of bricks imported from Milwaukee or Sheboygan, as those made here are much inferior on account of the lime which pervades the clay. But the greatest value of the ledge, in our estimation, lies in the fact that along its whole extent in the county, that is to say, for a length of about twenty-five miles, innumerable springs of pure and unfailing water gush out at intervals of from a quarter of a mile to not more than one mile, so cool that the thermometer plunged into them never marks more than from forty-six to forty-eight degrees, and entirely does away with the necessity of iced water during the hottest months; they never freeze.

A better watered section than the county of Fond du Lac could hardly be imagined. Almost every quarter section has a living stream of water, large or small, running through it; a circumstance of n small value to the agriculturist, and especially to the dairyman or grazier; for it is well known that all animals, even sheep, thrive best where they can have access to water at all times, and drink when they wish, especially towards the middle of the day, instead of being watered only mornings and evenings as is the usual practice where they have to be driven to water, or watered from wells. Besides, running water is always more acceptable to animals than well-water.

Where running water does not exist within the limits of the county, it can always be easily procured by digging, of a good quality, without the necessity of curbing, as the subsoil is sufficiently solid to remain as dug until the well is stoned up—sand being very seldom met with in digging. The usual depth at which good water is obtained by digging varies from twenty-five to forty feet, in rare instances the wells have to be sunk to a

depth of fifty-five feet, and sometimes even more. When water is obtained at such great depth, it is always very permanent. All that part of the county which includes the basin above spoken of, west and north of the ledge, can obtain running fountains by boring artesian wells at an average depth of forty-five to one hundred and twenty feet in extreme cases. Some fine flowing fountains in Byron are not more than twenty-five feet deep. The theory is that water percolates the land beneath the surface, in the same way that blood circulates through the animal system, and the water accumulated in the ground in the ledge uplands, through percolation, asserts its tendency to come to a level as soon as a vent-hole is dug, whereby its pressure forces the water above the lower-basin surface. In this way, innumerable artesian wells have been successfully bored in and around the city of Fond du Lac, and to this fact, as is well known, that city owes its name of FOUNTAIN City.

It may surprise some persons that the writer should enlarge so much upon the subject of water supply; but water is so absolutely indispensable to the successful prosecution of farming operations, that its abundant supply is a matter of paramount importance, and the wise man will avoid locations otherwise most desirable, when the supply of water is involved in doubt; for without such a supply, farming must necessarily be attended with failure.

The uplands, i. e., the lands above the ledge, are either oak openings or heavily timbered land, mostly oak and maple, which existed in the state of nature in large unbroken forests. But, for the last twenty years, the woodman's unsparing ax has been busily at work, so that probably not more than one-third of those magnificent woods are left standing; and it may be easily foreseen that, if the same wholesale destruction is carried on, but little wood will be left in a dozen years. Beside the portion required for the use of the owner of the timber, immense quantities are carted every winter to the city of Fond du Lac, probably not less than 20,000 cords every year, being disposed of at prices ranging from \$3.00 to \$5.00 per cord, according to quality and demand. Many of the prairie farmers own timbered lots at convenient distances, but some have to buy their wood.

Throughout the timbered section, there are several saw mills, where the finest white oak, ash, basswood and cherry timber are sawed into plow-beams, wagon tongues and felloes, carriage lumber and chair bottoms, or furniture lumber, and in that shape taken to the city manufacturing shops, where these articles meet with ready sale at remunerative prices. Staves and wagon spokes are drawn in large quantities.

The prairie portion of the county, as has been before said, has a rich, deep alluvial soil, mostly free from stones, with generally a clayey subsoil. It is adapted to the raising of the cereals. Corn and oats thrive especially well on the soil of the prairie. Manure is not absolutely necessary for many years after breaking, during which good crops are produced. These

lands are more liable to become foul with weeds than the apparently less rich soils of the oak-openings, and plaster produces no perceptible increase in the amount of the crops raised. Nature has everywhere held compensations for the apparent advantages of the prairie, which is easily brought into a state of cultivation and very rich in elements of vegetable production, but is generally less bountifully watered, more bleak in winter, less pleasant to plow because the rich loam does not clear the mould board or the hoe, and is more muddy. It is also generally devoid of natural shelter and of material for fencing and fuel, which the prairie farmer must buy of his apparently, but not really, less fortunate neighbor of the timber or openings. The prairie is, moreover, not so well adapted to the production of fine orchards, on account of the bleak winds of winter, which sweep with unchecked violence, and also because a large portion is underlaid by a stiff clay subsoil, which resists the full and rapid development of the roots of fruit trees. The finest orchards in the county are found in the timbered districts or in the oak-openings. Fruit trees are still trees; they thrive best on the lands on which the finest timber grows in the natural state.

Upon the whole, it is our opinion that, every thing considered, the oak-openings are the best lands for a farmer of moderate means. These lands seem to be less rich in vegetable producing elements than the other two (timber or prairie), but such is not the fact as demonstrated by that most unanswerable theorist—experience. The soil of the oak-openings is of a lighter color, but it produces the finest crops of cereals, including corn and also esculent roots. It plows very kindly, is never miry like the prairie where the reapers have sometimes become useless in wet seasons because they could not be worked in deep mud; the openings produce as much to the acre, and of plumper, heavier grain; manure works a more permanent benefit; they raise heavier crops of clover and other grasses, and the use of plaster is attended with wonderful effect, frequently doubling the crop of hay; orchards thrive better; they supply sufficient fuel and fencing material, and also in sufficient, though not in excessive quantities, that almost indispensable article—stones for cellars, wells, underpinnings and imperishable, handsome fences.

All the advantages mentioned in connection with the oak openings, also belong to the timbered sections, and the latter have the further advantage that, once cleared, they do not, like the openings, send forth a crop of useless and tangled grubs, which are very expensive to eradicate.

Beside the three kinds of lands which we have described, this county also includes a proportion, perhaps amounting to one-fifteenth of the whole, of marshes; but these have, in almost every instance, been ditched and reclaimed, and now make very fine mowing or pasture land, and are as highly valued as any other portion of the farm. A narrow belt of valuable cedar runs through the towns of Marshfield, Forest and Osceola. It supplies the

prairies with posts for fencing. Posts are worth from three to ten cents each. Large quantities are also rafted down from the Wolf river.

The climate is very fair, rather dry; at times very hot in summer, and pretty sharp in winter. The winters are generally of an even character, the thermometer mostly ranging above zero; thaws not very common. But some winters are very severe, say once in about eight or ten years, when the thermometer will go down as low as 20 degs., and even lower for two or three days at a time. It is extremely salubrious; chill and ague fevers are entirely unknown; those persons who brought them here from other sections were very soon free from them. Snows rarely exceed six inches in depth.

It is not thought desirable, in an article of this kind, which is intended to be rather descriptive than statistical, to go into the details of various farming operations. It is well known that real first-rate farm managers are rare, mostly owing to the high price of farm labor as compared with the returns derived from it. Assuming that, as a class, the farmers of Fond du Lac county are neither better nor worse than their brethren of other sections of our state, we will simply state what we conceive to be the usual averages, premising that we can hardly doubt that they could be easily increased by from 50 to 100 per cent. with more careful cultivation and greater expenditures in labor and fertilizing materials, as well as by judicious and systematic rotation of crops: Wheat, 16 to 24 bushels; corn 40 to 50; rye, 20 to 25; oats, 35 to 50; barley, 25 to 32; potatoes, 100 to 120. This estimate on potatoes does not take into the account the depredations of that late pest, the Colorado bug, which last year almost entirely ruined the crop.

The cultivated grasses, especially with the use of plaster, yield from two to two and one-half tons for timothy and clover, and the latter, if cut early in July or late in June, will yield a second crop nearly equal to the first cutting, or a fine crop of seed. The raising of clover is a very important element of success in the culture of the openings. By its use the land may be enriched while producing returns in crops, by feeding and pasturing. Clover is, however, liable to be thrown out by the frost in winter or spring, and this causes a disappointment to the farmers' hopes.

The stock raised in the county is generally fair, and will hold its own as compared with other sections. It would be difficult to produce finer horses, Devons and Durhams than are found with several farmers in this county, especially about Ripon.

Not much can be said in favor of Fond du Lac as a fruit growing region. Apples of hardy varieties are tolerably certain of profitable returns. The cultivated kinds of plums also occasionally succeed. But the fruit culturist is apt to meet with grievous disappointments. Those persons who reside in the cities succeed in raising fine pears, quinces and grapes in large quantities, on account of the protection afforded by the houses against bleak winds. The Tallman Sweeting, Seek-no farther, Snow apple, Duchess of

Oldenburg, Red Astrachan and Russian apples generally, as well as some other kinds, resist the climate; none but the hardiest sorts should be planted. The crop of apples in 1870 was about equal to the demand.

The money value of land in any part of the world is the safest guide to its worth as compared with other sections. The average price per acre throughout the county is probably \$45 to \$75 for good improved farms, and for two or three miles from the city, from \$75 to \$100, and even higher in a few cases. Wild land, of which there is but little, sells at from \$10 to \$45, according to location.

No mineral of any sort, within the limits of the county, has come to the knowledge of the writer, except a bed of iron under the stone ledge in Taycheedah, owned by Mr. Belt. Whether it will prove worth working, is still in doubt. Indications of lead have also been discovered, but nothing certain. It is highly probable that both lead and iron exist in paying quantities, but it is, as yet, mere speculation. Erratic blocks of copper are occasionally found.

Within a few years past, great changes have taken place in the system of farming in the county of Fond du Lac. Farmers have begun to realize the folly of wearing out their lands in the production of wheat, at an average cost of one dollar per bushel and selling it for eighty-five cents. Wisconsin men begin to see that the time is past when they could raise wheat for fifty cents at a large profit. Only new and cheap lands can do this. That belt is now 500 miles west of us. A few years more will see that used up also for wheat production; as, successively during the last forty years New York and Pennsylvania, then Ohio and Indiana, Michigan and this state, have led the list as wheat producing states. The state of New York, which thirty or forty years ago, exported many millions of bushels of wheat, now raises less than its home consumption of this cereal requires, by from twelve to fourteen millions of bushels. Other productions are found more profitable and will so remain until the exuberant wheat producing capacity of the western plains becomes in a measure exhausted. Wheat is too heavy and bulky to be profitably transported to great distances. The rapacity of railroad companies aggravates the necessary evil; they charge more on transportation to and from those sections which are entirely dependent on their roads and less on those that have competing lines. Fond du Lac is much favored; from it produce can be sent to either Chicago, Milwaukee, Sheboygan or Green Bay by rail, or to the latter place by water, also. It is, perhaps, not generally known, that many cargoes of wheat and other produce have been shipped from the city of Fond du Lac directly to Buffalo and other lake ports without breaking bulk. The Fox River improvement is about to pass into the hands of the general government, when it is expected that the largest class of propellers will reach this point. But for all this, our farmers realize that the best market for their produce must be that designed by nature, viz: *the home consumption*. Our cities already consume

largely of the agricultural produce of the surrounding country, and as the manufacturing enterprises increase, the proportion of home consumption is constantly becoming larger; as a consequence, prices are tending to become more remunerative.

That the county of Fond du Lac is making rapid advances in wealth and population, is undeniable. In 1860 its population was 34,155; in 1870 it is 46,292, a gain of 12,138 in ten years. During the same time, the fine county of Dodge has made but slight progress. We ascribe this result to the fact that Fond du Lac has large and constantly increasing manufacturing interests, whereas Dodge county has hardly any, and is almost exclusively an agricultural county; but having no home interchange of agricultural products, it is drained of its earnings for the benefit of other and more favored sections. Winnebago county, in which is the lively manufacturing city of Oshkosh, is another illustration. Its population in 1860 was 23,769. It is now 37,325, a proportionate gain even larger than that of Fond du Lac. Still, for several causes which we deem unnecessary to name, except that Fond du Lac controls the local trade of a much larger territory, we think the latter city will retain the rank of second city which it has attained. Outagamie county, which has doubled its population within the last decade, and Brown, which has done even better, are other illustrations. Dodge, if not superior to the other three counties named, is certainly equal to them in an agricultural point of view. Walworth and Washington counties, which are purely agricultural, have either retrograded or made very slight advances in spite of increased railroad facilities; which is a further confirmation of the fact, well established the world over, *that no purely agricultural country ever attains the highest prosperity*; that is reserved for those sections which combine manufacturing and commercial interests with those of agriculture. The truth of this position is *incontrovertible*. New England, New York, Pennsylvania, England, France and other countries are living proofs of its truth. Land will always command the highest prices and agriculture flourish most in the neighborhood of large manufacturing and commercial centers, where capital always accumulates. It makes very little difference to the general prosperity of the country whether the city or the farming interest secures the balance of trade in its favor; for that balance of trade *is never remitted abroad*. In either case it stays at home; and whichever of the three interests—manufacturing, commercial or agricultural, makes the largest profits, simply adds most to the general gains from which nothing is detracted, nothing removed or carried away; but all of which remains at home to swell the general prosperity and the general wealth. Contrast the condition of Spain, Italy, Austria, Greece, Turkey, all purely agricultural countries, with that of the other countries named above, and draw your own inferences!

The manufacturing and commercial countries are not ahead of those just named in material well-being merely, but also morally, socially and intel-

lectually. Commercial intercourse and mechanical ingenuity tend to develop the mind and the highest intellectual faculties of man.

It is, therefore, with no small pride and pleasure that we here record the advancement of the city of Fond du Lac as a manufacturing city. Among its leading establishments we will mention the manufacture of vast quantities of lumber from logs rafted down from the pineries of the Wolf river and its tributaries, which are here cut into timbers, planks, boards, lath and shingles, to the amount of 100,000,000 feet of all sorts, and about 20,000,000 shingles.

Here are found several sash, door and blind factories, one of which, owned by C. J. L. Myer, is said to be the largest establishment of its kind in the world. Its products find their way to Chicago, St. Louis, and even to New Orleans. Two very large founderies and machine shops, at which the largest class of steam engines can be made; one large tannery, operated by steam power, capable of converting into leather all the hides produced by this section; a wagon factory capable of turning out ten wagons per day, which sends its vehicles to Omaha, Sioux City and over the whole west; a dozen other shops at which wagons are made upon a smaller scale. Here are also located the shops of the Chicago and Northwestern Railroad, which employ many skilled mechanics and turn out a large number of passenger and freight cars; two flouring and one plaster mill; a large paper mill is now being built, and a blast furnace is nearly completed, which will go into operation in a few months, and in connection with which it is understood that Messrs. Myer and Boyd, its owners, intend to operate a rolling mill, a machine shop and other establishments, too numerous to mention in detail. We have also several planing mills, cabinet and other manufacturing establishments, as well as many elegant stores doing an extensive business.

The above are only a part of the constantly increasing manufactures of Fond du Lac. The completion of the Sheboygan and Mississippi railroad, by opening new markets, will greatly stimulate them and increase their prosperity. Two miles east of the city, is the woolen mill of Messrs. Carpenter & Sons, which turns into cloth and blankets a small portion of the wool raised in this county. There exists no good reason why it should not all be manufactured here, instead of being sent to the eastern states.

As, in all probability, the volume for which this article is written will contain statistical tables compiled from the late United States census, the writer does not deem it necessary to go into any minute details of statistics, which will appear in those tables with greater accuracy than he could possibly furnish.

We can state with truth and confidence that to the emigrant, the agriculturist, machanic or capitalist, the city and county of Fond du Lac offer inducements unsurpassed by any section of Wisconsin, or of the whole west.

The educational facilities, although we cannot boast the possession of any university or college, are also excellent, and Fond du Lac possess compe-

tent teachers and professors in all the branches, scientific, useful and ornamental which constitute a finished education.

There are, in this county, several agricultural associations or societies, which hold yearly, both at Fond du Lac and at Ripon, very creditable exhibitions, and let me say here *en passant* that the reason why the agricultural society of the state of Wisconsin has never graced and honored this section of the state with a single one of its annual exhibitions, has never been satisfactorily explained. Being in part supported by funds from the whole state, it does not appear liberal or even just, that this beautiful and rich section should thus be year after year ignored by the state society. We sincerely hope to see this neglect and injustice speedily corrected. That portion of our state, which extends from Fond du Lac to Green Bay, is now by far the most progressive; as demonstrated by the late census, and this fact should be recognized.

Among the agricultural interests of the county, dairying is assuming an important place. There are five or six extensive cheese factories, several more just started at the time of taking the last United States census and therefore do not appear in the aggregate statistics of the county, besides many private ones; their numbers and importance are on the increase; cheese-making and butter-making are more profitable than the raising of wheat, because those articles have a greater concentrated value. The same remark applies to fat cattle and hogs as well as to the raising of wool. All these branches of agricultural industry are prospering and increasing.

The public improvements of the county of Fond du Lac are neither very extensive nor very costly. They consist principally of the churches, of which the city has some twelve or fifteen, some of them elegant structures; a stone jail, equal if not superior to any in the state, and costing nearly \$40,000. The court house is an old and inadequate building, which it is intended within a couple of years to replace by a large and commodious edifice, that will accommodate all the officers of the county. A fund has been accumulating for the purpose for several years, at the rate of \$15,000 annually, which now amounts to about \$60,000. When this county erects a new court house it will be of such a character as to be a worthy representative of its wealth and refinement.

A great change has taken place in the streets of the city. Many of them have lately been substantially built, at heavy expense, and are now firm, smooth and durable. The principal business portion of Main street, for more than one half mile, has been built of the Nicholson pavement. Good gravel roads exist on the five main arteries of travel from the county to the city of Fond du Lac, for an average distance of four miles, and are kept in repair by the Fond du Lac Gravel Road Company, under whose auspices they were built. Toll is taken, which is mainly expended in keeping them in good condition. Although the country roads are far from being bad, still they are not yet as good as would be desirable.

A pamphlet, just published, has been compiled by the Secretary of State. From a copy forwarded to us by the Secretary of the State Agricultural Society, we extract the following, showing the rank of Fond du Lac county to be:

3d for wheat	1, 610, 362	bushels.
27th for rye.....	13, 742	...do...
13th for corn.....	284, 535	...do...
5th for oats.....	976, 660	...do...
7th for barley.....	59, 493	...do...
9th for potatoes.....	251, 425	...do...
3d for wool	270, 590	pounds.
3d for butter	1, 118, 361	...do...
9th for cheese.....	60, 793	...do...
17th for hops	50, 132	...do...
1st for hay	76, 637	tons.
5th for agricultural productions and improvements..	3, 572, 433	dollars.
4th for product of manufactures	3, 359, 876	...do...
2d for last two items.....	6, 932, 309	...do...

Milwaukee county alone is ahead of Fond du Lac county in general aggregate production. Dodge and Dane follow closely, the first with \$6,715,237; the latter with \$6,604,610.

Let us, in conclusion, say a few words as to the social condition of the people. The county of Fond du Lac is now third in population. Milwaukee and Dane counties being ahead. Some authorities place Dodge county as coming next, others make Fond du Lac the third. But Fond du Lac is ahead in density of population.

Owing to the low price of lumber and building materials, no part of the state possesses finer country residences or more convenient and numerous out-buildings. Many of the country houses or city residences are first-class, and enjoy the highest comforts known to modern civilization, being stocked with rich and elegant furniture, including in nearly every instance, a piano, of which there are at least four hundred in the county, or an organ or melodeon.

The people are polished, intelligent, well informed; the business men are not slow in improving the advantages of their position. Nearly one-half of the whole population reside in the cities and villages; Fond du Lac having 12,765 and Ripon 2,977 or more than one-third of the whole. The tendency appears to be toward a larger relative population in favor of the cities and villages. We merely state the fact, reserving our private opinion as to its wisdom. It is undeniable that many persons seek residences in cities, where they drag a wretched, dependent existence, who might be happier on small homesteads, even as laborers, in the country, but: *de gustibus non est disputandum*. Certain it is that the cities furnish nine-tenths of all the paupers. The county owns a fine poor farm, where the poor are kept. They are not numerous.

A thriftier, happier set than the people of this county, taken together, is not to be found within the limits of Badgerdom.

GRANT COUNTY.

Grant county is one of the largest of the settled counties of the state, embracing thirty-six townships and fractions of townships. It is situated in the southwestern corner of the state, and is bounded on the north by the Wisconsin river, on the east by Iowa and La Fayette counties, on the south by the state of Illinois, and on the west by the Mississippi river.

The surface rock throughout almost the entire county is the Trenton limestone. Along the Wisconsin river, however, there is a narrow strip along which appear lines of upper sandstone, magnesian limestone and Potsdam sandstone. The surface is undulating; in some portions hilly. Although usually regarded as a prairie and "opening" county, there are considerable bodies of hardwood forest timber in the southern and north-western portions.

Grant is well watered by numerous small streams, emptying into the Wisconsin and Mississippi rivers, and has a fertile soil well adapted to the various crops common to this latitude.

Although its developement has been much retarded by the want of railroad improvements, it has steadily grown in wealth and population, as will appear by the following figures:

	1860.	1870.
Population	31,207	37,975
Acres of land in farms	163,463	288,691
Estimated value of farm products (census 1870)		\$3,515,049
Value of manufactures .....do.....		<u>1,039,841</u>

The farm cultivation compares favorably with that of other counties. Stock-growing, though slower in making that progress which has distinguished some other portions of the state, is now advancing at a commendable rate. While favorable to stock-raising generally, it is especially adapted to sheep-husbandry, which must accordingly receive more and more attention. Fruit-growing has also received considerable attention, and has been quite successful.

The most important products of manufacturing industry are flour, pig-lead and woolen goods; the total value of which in 1870, as per United States census of that year, were respectively as follows:

	Value.
Flour... ..	\$397,393
Lead	270,447
Woolens	<u>65,478</u>

The business of mining, which, in the early history of the county, was the leading interest, has, of late years, somewhat declined in activity here, as elsewhere, in the lead district. Nevertheless, there are immense deposits of both lead and zinc still undeveloped. The mines hitherto most productive are found in the regions about Hazel Green, Platteville, Potosi and Beetown.

The chief towns are Lancaster, the county seat, and Platteville, now distinguished as being the seat of the first State Normal School, and also as being the only town, excepting Boscobel and Muscoda, on the Wisconsin river and the Milwaukee and St. Paul Railroad, which have railroad connection with the rest of the world. It is worthy of remark, however, that measures are now on foot which promise to secure the early extension of the southern branch of the Milwaukee and St. Paul Railroad from Monroe to Calamine, and of the Calamine and Platteville road directly across the county to the Mississippi river.

The population of Grant compares favorably with the best in any portion of the state for industry and intelligence, and the county is accordingly characterized by all those educational and other like improvements which indicate the social progress of a people.

GREEN COUNTY.

BY DR. JOHN C. HALL OF MONROE.

Green is one of the southern tier of counties in Wisconsin, lying midway between Lake Michigan and the Mississippi. It is a square of sixteen townships, and has a population of 23,609.

Physical Characteristics.—While there are considerable acres of level lands in the eastern and southeastern portions of the county, the surface is for the most part gently rolling—rising, however, in the northern and western sections of the county, into high bluff hills. From east to west the general surface is crowning, the summit of which, in the southern border, is on the central line of the county, where the underlying rock—Galena limestone—reaches its highest elevation in the state. This somewhat irregular swell of land forms the “divide” between the Sugar river on the east and the Pecatonica on the west, its surface being somewhat diversified by the valleys of the numerous tributaries of these streams. From the summit level of this “divide” going west there is a slight dip of the limestone strata, while it is nearly level to the east. This furnishes, however, no indication of the configuration of the surface, for this strata becomes rapidly denuded, or thinned out, from the central axis in both directions until the underlying Trenton limestone is reached in the valleys of the Sugar and Pecatonica rivers. The latter river in fact cutting through the latter strata, and also the St. Peter’s sandstone underneath, finding its bed at last, in the southern border of the county, upon the lower magnesian limestone,

The lower and more level portions of the county to the east, consists of open prairie or bottom lands. Across these prairies, in various directions, run sharp, narrow ridges of stratified rock; which have resisted the agencies

to which the original contiguous surface has evidently yielded, and they enclose and shelter some of the finest prairies and richest valleys in the state.

I have been a little particular in giving the geological formations of the county, as it naturally precedes an account of the soils, and furnishes an indication of their character and of the agricultural advantages of the county.

These advantages embrace fertility and variety of soil; a diversity of exposure arising from configuration of the surface; an ample supply of timber for fuel and fencing, and of water for stock and household purposes. The prairie soil is a deep, nearly black loam, with a large admixture of vegetable mould, resting upon a grayish clay loam of several feet depth. A narrow belt on the eastern border of the county is to be excepted from this description. This is that portion of the Sugar River Valley where the soil is a light, sandy loam, and derives its character from the underlying and surrounding sandstone. The soil of the timbered lands is a deep clay loam, producing when cultivated abundant crops of every variety grown in this latitude, but specially adapted to wheat, fruit and to grazing purposes.

Timber.—One of the great advantages of Green county, and indeed one of its most striking peculiarities, is the extent and remarkable distribution of its forests. Timber and prairie, prairie and timber everywhere. Originally much more than half the surface was covered by forests; a large portion of this was what are called oak openings, which have now disappeared. There are fine belts of heavy timber in various parts of the county; in fact nearly every town has forests of greater or less extent. Sometimes this timber occurs in isolated groves of five, ten, twenty, forty and eighty acres. White, red and black oak, sugar and soft maple, basswood, black walnut, butternut, poplar, hickory, elm, black and white ash, are found in nearly all these groves, in quantity about in the order in which they are named. The value of these forests cannot be over-estimated; they constitute, in fact, one of the most notable and attractive features of the county.

Besides the two rivers mentioned, there are several tributary streams of considerable size, most of which furnish valuable hydraulic power, utilized for grist mills, saw mills, carding mills, etc.

There are also numberless springs and small rivulets scattered in every part of the county. And here we discover the utility of those hills in the northern and western sections, which are generally regarded with disfavor by those who judge of the value of farming lands by the level prairie standard. They are the sources of innumerable springs and streams that give an unfailing supply of pure water to hundreds of farms. Besides this they unquestionably modify the climate beneficially, not only increasing the rain-fall, but furnishing shelter to stock, and fruit farms. But few of these hills are not susceptible of profitable cultivation, and even where they are not, they are covered with valuable forests which still more favor-

ably modify the climate. The ever growing wealth of a colony of Swiss who settled in among the hills of New Glarus seven years ago shows what can be done with such unpromising lands.

The character of our farming is such as has naturally grown out of the physical peculiarities of the county. Grain growing for market is constantly becoming relatively less. Stock raising and its allied interest—dairy farming—are just as constantly on the increase. Wool growing is an important interest; and every year we hear less complaint that “this is not a fruit country.” In short the farming of this section is of that mixed variety which, on the whole, is found to be most uniformly successful.

Manufactures.—While agriculture is, and will probably remain the leading industrial interest of Green county, its manufactures are neither few nor unimportant. The hydraulic power furnished by Sugar river, the Peca-tonica, and their numerous tributaries, is used mainly for grist mills. There are one or more of these mills in every township, thus furnishing a most desirable accommodation to all our farmers. There are also numerous saw mills situated in various parts of the county, some of which are steam, others, water mills. At Monroe there is a large planing mill and sash and blind factory, and also one at Albany. Next to making flour, wagon and carriage making is the most important manufacturing industry. There are establishments for this purpose that are quite extensive and turn out first class work. Besides supplying the local demand these carriages and wagons find markets in Minnesota, Iowa and Missouri. There are three woolen mills in the county, one in Monticello, one in Spring Grove and one in Adams.

There is no surer indication of the profitableness of agriculture and the industries, of social progress, and the general prosperity of the people, than is found in the rapid and continued growth of the mercantile interest. In proportion to the population, the quantity of dry goods, groceries, hardware, boots and shoes and clothing sold in the county, is enormous.

The quantity and value of pork, stock, grain and produce shipped at the railroad points—Monroe, Brodhead and Juda—I think I am safe in claiming are unsurpassed by any equal area of country tributary to the same, in the state.

The Monroe branch of the Milwaukee and St. Paul Railway which passes through the southern part of the county, furnishes the principal railroad facilities of Green county. The Madison branch of the Northwestern Railway, touches the northeastern corner of the county, and has a station in the town of Brooklyn. There are two other projected lines of railway extending north and south through the county, and will undoubtedly be completed within a year or two.

The people of the county, on the whole, take an enlightened and liberal interest in the subject of education, and our public schools as a consequence, are generally well conducted, and are constantly improving in effi-

ciency and usefulness. In the character of school buildings there is a marked advance. They are more tasteful, more commodious, and better finished.

Besides the evidences of special progress I have given, I might add that the rapid increase of better buildings of all kinds, the almost universal adornment and tasteful furnishing of private dwellings, the planting of shade and ornamental trees, and the cultivation of flowers to make *homes* more attractive and beautiful, are all sure indications of social and moral advancement.

GREEN LAKE COUNTY.

BY M. H. POWERS, DARTFORD.

Green Lake county is one of the smallest counties of Wisconsin, being four townships in length by three in breadth in the southern part, and two in the northern; ten townships in all.

It is situated near the geographical center of the state. The Fox river traverses it from near the southwest corner to the northeast, passing through, or forming a portion of the borders of five of the towns, and affording transportation facilities, in a greater or less degree, for the entire county.

The Milwaukee and St. Paul Railroad passes near its eastern boundary and enters the county in the town of Berlin. Several projected lines of railroad are before the public, some of which, if they are consummated, cannot fail to pass through its territory either in its northern or central portions, or both; and surveys of the Milwaukee and St. Paul Railroad have been made looking to an extension towards Stevens Point, Lake Superior, and a connection with the Northern Pacific.

The Fox and Wisconsin rivers ship canal has many warm advocates in this county. Its early completion, it is believed, would greatly promote every material interest, not only of this county, but of the adjoining counties, as well as of the whole Northwest.

By the census of 1860 the population of the county was 12,663; in 1870 it is 13,287. Berlin, Princeton and Markesan are the incorporated towns in the county, of which Berlin is the most important, having a population, in 1870, of 2,778. It is situated on the Fox river, at the point where the Milwaukee and St. Paul Railroad connects with it, giving it the advantage of both railroad and water communication. It is the seat of a very extensive trade, especially with the country north and west of it. Several branches of manufactures are established here, which are growing into very respectable proportions. Among which may be specified mills for the manufacture of lumber, from one to three of which have been running since the settlement of the town, and have added not a little to its development and wealth. Some three or four wagon and carriage shops have given employ-

ment to a large number of hands, while the usual complement of workers in wood and iron in the finer, as well as coarser, varieties of the arts are not wanting. There are also three steam flouring mills, and one steam woolen mill of some half dozen looms, that furnish employment for a number of hands, and convert the produce of the country into marketable commodities.

Princeton also is situated on the Fox river, a few miles above Berlin. It has an extensive trade and is a thriving village. It has an iron foundry, a flouring mill, wagon and other shops. Marquette is a river town of considerable trade, especially in lumber and grain. Markesan is an inland village surrounded by a very rich and fertile country; has a good water power, a prosperous trade with the surrounding country, and only needs railroad facilities to make it one of the finest points in this part of the state. Dartford, the county seat, is situated on the outlet of the lake, from which the county derives its name. It has a beautiful location, overlooking the lake, and, besides, the court house, jail and county offices, has two flouring mills and the usual variety of mechanic's shops. Kingston and Manchester are inland villages with each a flouring mill, and they are, each of them, the center of some trade.

The lake, from which the county takes its name, is considered one of the most beautiful sheets of water in the country. It is twelve miles in length and from two to three in width. The waters are very deep and pure, and of a very beautiful light green color—so clear that the bottom can often be seen at a depth of twenty or thirty feet. The shores nearly always high and dry—though not as wild as those of Lake George, or as tame as those about most western lakes—are strikingly beautiful.

There are within the county 96,994 acres of improved lands, producing in 1870, 536,185 bushels of wheat, 15,057 bushels of rye, 252,916 bushels of corn, 297,611 bushels of oats, 16,731 bushels of barley, 89,659 bushels of potatoes, 119,423 pounds of wool, besides butter, cheese, hay, hops, etc., amounting to an estimated value of \$1,481,132
Value of manufactured articles..... 723,265

Total..... \$2,204,397

The surface of the county is undulating, no part of it can be called hilly, neither is but a small portion of it level. Brooks and creeks, and small lakes abound in every portion, and, except along the Fox river, water powers are found in nearly every town.

The greater part of the county in its primitive state was covered with timber openings, The soil alternating between clay and sand. The eastern portion for nearly its entire length and varying from one-half mile to seven or eight miles in width is prairie. All of it producing wheat as its first and most important crop, but gradually extending to other small grains and finally to grass and fruit. The grasses, especially clover, do well and are receiving much more attention than formerly. It is found that manure does no harm to the soil, and even gypsum has an increasing number of

advocates. Fruits, especially the apple and pear, thrive as well, and perhaps better, than in any other part of the state. The lands around the lake seem to be peculiarly adapted to this purpose, the trees of hardy varieties growing well and bearing abundantly. Much loss was formerly incurred by lack of knowledge of the varieties of fruit trees adapted to this country. Tree peddlers and agents from the east and south brought trees that were successful in their respective localities, but which failed after a very few years; and many orchards were utterly ruined; many more were left with scattering trees of the hardy kinds, and the owners were so disheartened in many instances that they refused to fill the vacant spaces or even to take proper care of what they had left.

Another cause of failure has been the propagation and sale of trees covered with bark lice. The idea has been promulgated that the apple tree well manured and cared for, like the well fed calf, would outgrow the lice, and in time become healthy and thrifty. There is no doubt that liberal treatment will enable them to withstand any difficulties of this kind better than continued neglect, but there is no disguising the fact, that many orchards have partially failed, and will in time become entirely ruined from this cause. Trees are found unthrifty, black-hearted, decaying and finally dead without any other apparent cause, and certainly all that are thus affected will follow in this course unless they can be relieved from this parasite. If the careless growth of the Canada thistle, burdock and other noxious plants is a proper subject of legislative authority it seems as if the dissemination of this pest of the orchard ought to be prohibited by law.

It has become the custom in this county, for every farm house and village residence to be flanked by a few grape vines. The Delaware, Concord and Clinton succeed well, the Isabella generally ripens, and several of the other kinds succeed with proper attention.

The marshes in the northern part of the county, and in some of the adjoining counties have, since the first settlement of the country, been the home of the cranberry. But since the vines have been protected from the fires that used to run over them, and some attention given to drainage, and where dams have been erected by which the grounds are covered with water at the proper season, and proper care used in picking the berries, the productiveness is vastly increased. The quality of the berry is also greatly improved. The cultivation of this fruit is just now, perhaps, the most profitable business in this part of the country.

The population of this county, like most western communities, is made up from all the nations of the earth, but the universal Yankee and the Germans are the most numerous represented. While there is no occasion to boast of any unusual intellectual or moral endowments, on the other hand there is an average amount of culture, and taken as a whole the people of the county will compare favorably with the people of most parts of this or any other country. Schools abound everywhere, and it is believed the quality of instruction imparted in them is improving, slowly, perhaps, but

surely, every year. Churches are found not only in cities and villages, but the country is dotted with them throughout its entire extent, and the number is annually increasing.

Should the county progress in the future as it has in the past, though it may not rise to the position of first in the state, yet it will be one of which its citizens need not be ashamed, and one which will bring no discredit to the state of Wisconsin.

IOWA COUNTY.

Iowa county is located in the southwestern portion of the state, in what is commonly known as the lead region. The Wisconsin river forms its northern boundary, Grant county lies on the west, La Fayette on the south, and Dane on the east. In common with the neighboring counties, where lead is found, the development of its agricultural resources, and a system of general industry, was retarded by the almost exclusive attention paid by the early settlers to mining; but within the past few years great advancement has been made in this respect, and now the county ranks as the thirteenth county in the state for the aggregate value of her agricultural productions. There are 170,147 acres of land under cultivation; from these were raised, according to the census of 1870, of wheat, 767,875 bushels; oats, 829,470; corn, 689,211; butter made, 555,181 pounds; with the usual variety of other crops in proportion. The population of the county is 24,555. There are neither state or government lands unsold in the county.

The railroad facilities are good. There is a road running to Chicago from Mineral Point, and the Milwaukee and Prairie du Chien running the whole length of the county on the north. There are quite a number of lead ore furnaces in the county, and one zinc ore furnace, making as good a quality of zinc as can be found in the world. It is made from *black jack* and *dry bone*, two kinds of ores that were useless rubbish until the above named furnace was built. A large amount of zinc ore is shipped to La Salle, Illinois, St. Louis and other places. The central and western portions of the county contain agricultural lands of the very best quality; and where the land is broken and hilly, the Welsh and Norwegians, interspersed with Americans and other nationalities, in their search for good water and pasturage, have made it a very garden.

JACKSON COUNTY.

Until within the past few years lumbering may be said to have been the exclusive industrial interest of this county. The amount of attention paid to agricultural pursuits is increasing, but it is yet comparatively small, as

is indicated by the number of acres of improved lands (35,217). The soil is mostly clay or loam, and is well adapted for general cultivation. A very superior quality of wheat is raised, which is pronounced as good as any in the market. Excellent crops of oats, rye, barley, corn and potatoes are raised, which find a ready market among the lumbermen of this and neighboring counties. We have some very fine blooded stock, and very fair grades. The good qualities of the former have been largely instrumental in improving our common stock.

The surface of the country is good; in the western and northern portions it is high rolling land, with oak timber on the ridges. Scarcely a section of the county but has abundance of water. The Trempealeau and Black rivers are the principal streams. These, with their tributaries, and, in fact, all the streams are lined with pine, tamarack and other valuable timber. In the northern part of the county are a number of cranberry marshes.

Above Black River Falls is an extensive deposit of iron of an excellent quality; also occasional mounds of iron, and indications of the mineral, are found scattered over the northern part of the county. There is a great abundance of the ore, and it must ultimately be a great source of profit to this section of our state.

The population of the county, as given by the last census is 7,712. There is here a large and promising field open to the laborer or capitalist, and one that will yield large returns at no distant day.

JEFFERSON COUNTY.

BY D. W. BALLOU, WATERTOWN.

Jefferson is an interior county in Wisconsin, not exactly central as regards territory, but nearly so as to population. Its surface is gently rolling, or undulating, interspersed with woodlands, prairies, natural pastures, and "openings," with no deep valleys or barren hills, but abundantly watered with lakes, rivers, creeks and springs, and thickly covered with heavy forests containing a choice variety of timber, fully sufficient not only for fuel but for manufacturing purposes. An examination of any good map will show that it is amply supplied with admirable railroad facilities, being penetrated with lines running in almost every direction—furnishing convenient means for travel, trade and transportation. Taking the city of Watertown as the pivotal point, the communication with Chicago, Milwaukee, Green Bay, La Crosse, Prairie du Chien, and the intermediate places, is direct and permanent.

In few counties in the state can so many attractive and flourishing villages be found as in Jefferson. Aside from the city of Watertown, which, with its population of nearly 8,000, ranks first in importance, there are Jef-

erson, the county seat, Fort Atkinson, Lake Mills, Waterloo, Palmyra, Ixonia, Hebron, Milford, Aztalan and Rome—all handsomely located and rapidly improving; their educational interests carefully attended to, with school buildings that would be creditable to the taste and liberality of any community.

The population of Jefferson county has steadily increased from the date of its organization in 1839, to the present time—each national or state census testifying to the fact that its growth, if gradual, has been continual. It now contains 34,050 inhabitants, according to the official returns of 1870. When this is the case, through a series of decades, progress may be expected to be equally uniform in other respects, and consequently the years that have brought an increase of numbers have also brought with them an increase in intelligence, refinement, culture and activity. Churches, academies, school houses and newspapers abound, and these sources of moral and intellectual development are universally cherished and generously encouraged. At Watertown the Northwestern University has been established and provided with an able Faculty, while at Jefferson, a Liberal Institute is in successful operation, affording opportunities for the youth of both sexes to pursue a collegiate course of study, where the means and desire for classic and scientific acquirements prevail. The public schools of the county maintain a high standard of excellence, and are under the control of teachers of tried qualifications.

The past ten years have witnessed a marked and favorable change in all departments of industry in Jefferson county. More of the productive soil everywhere met with, has been brought under cultivation, and the tillage is more thorough and systematic. The quality as well as the quantity of a crop is much more properly appreciated than formerly. The farmers, as a general rule, have shown an eager and commendable disposition to promptly avail themselves of the many inventions and labor-saving implements which American genius and skill are constantly providing to lessen the toils of the husbandman. As the sickle disappeared a generation ago, so the cradle is now more and more rarely seen in the broad, waving grain fields; but the swifter and surer reaper has taken its place, accomplishing in a day the hard and exhausting work of a week, during the busy and pressing harvest season. The ponderous threshing machine has superseded the light and slow flail.

The cultivation of fruit is receiving much more attention than formerly. The causes of previous failures are investigated and practical remedies proposed. Some portions of the county, as a matter of course, are better adapted to experiments of this kind than others, and where the soil and climate have proved suitable, large and thrifty orchards beautify the landscape, yielding plentifully, and supplying for home consumption a large proportion of the apples, pears, plums and cherries that once had to be procured from abroad. Grapes, blackberries, raspberries and strawberries

can be grown almost anywhere with ordinary ease. Several large vineyards have already been started, and so far as is known, proved profitable investments for the owners.

The dairy business is rapidly assuming prominence. Six or seven well-regulated and well-managed cheese factories, in various localities, attest the correctness of the statement that this branch of co-operative husbandry is not neglected, but is being conducted on a comprehensive scale. So far the result seems to be entirely satisfactory, and promises well for the future.

Lately, stock raising has attracted more of the notice its importance deserves. Purer and better breeds of horses, cattle and sheep may now more frequently be observed than was once the case. The scrubs are becoming scarcer, and superior animals more numerous. Even the "hen fever" has raged quite violently, and in many yards the display of "fancy birds" is by no means to be despised. Every agricultural fair demonstrates that the tendency is "upward and onward" towards the highest and best. Building materials are readily obtainable everywhere. Hard lumber is made from the forests, and pine brought from the north. The finest varieties of cream-colored brick are extensively manufactured at Watertown, Jefferson and other points, while in some places stone can be found.

Various kinds of manufacture diversify the pursuits of the different classes of society, giving remunerative employment to capital and labor. Flouring mills, woolen factories, window, door, sash and blind factories, bedstead and chair factories, stave factories, knitting machine factories, cabinet factories, and many other similar enterprises are carried on in different towns, adding to the prosperity and resources of the community.

Such is the picture which a hasty and imperfect glance at the present condition and prospects of Jefferson county discloses to view. With a prolific soil, healthy climate, and enterprising people, it has durable and solid foundations for continued growth and development. Taking everything into consideration, it holds out inducements to all seeking new homes in our magnificent commonwealth, that are certainly not surpassed by those offered elsewhere. Within its limits are the elements of rational happiness and contented enjoyment, which need only to be wisely used to secure the chief blessings of life; and what more have the mass of mankind to expect in any region of the globe?

JUNEAU COUNTY.

BY J. T. KINGSTON, NECEDAH.

The agriculture of Juneau county is yet but slightly developed, owing partly to the recent settlement of the county, now scarcely twenty years, but more, perhaps, to the fact that the inhabitants of the central and north-

ern portions are mostly engaged in the manufacture of lumber and other productions of the forest. Still, the increase in population and the agriculture of the county, since the census of 1860, have been very satisfactory, and fully equal to that of any of the counties adjoining.

The population of the county in 1860 was 8,770; in 1870, 12,396. The agricultural productions for those years were as follows:

Years.	Wheat.	Rye.	Corn.	Oats.	Wool, lbs.
1860	72,275	6,037	57,499	79,656	1,999
1870	194,048	15,373	120,890	196,263	27,025

Agricultural Productions—continued.

Years.	Potatoes.	Barley.	Hops, lbs.	Butter.	Cheese, lbs.	Hay, tons.
1860	39,598	1,459	.....	112,640	6,672	9,021
1870	105,264	4,596	535,281	220,200	3,420	15,270

The value of agricultural products and additions to stock in 1870, was \$684,610. and the value of manufactured products \$818,820—total, \$1,503,430; being \$121 per capita of the population.

Fruit being a slow growth, and owing to the recent settlement of the county, does not appear in the census statistics. Still, fruit of several descriptions are raised to a considerable extent, sufficient at least to establish the fact that for raising apples, pears, cherries, tame plums and grapes, and all kinds of small fruit grown in Wisconsin, Juneau stands second to no other county in the state. At the county fair, held at Mauston, the county seat, in the fall of 1870, over one hundred varieties of apples, seven of pears, and fifteen of grapes—all the production of Juneau county—were on exhibition, and for beauty and quality could not be excelled in the western country.

Perhaps no county in the state presents equal advantages for the cultivation of cranberries. The Lemonweir and Yellow rivers, and tributaries, pass through and drain the "Great Cranberry Marsh," lying along the border of the northwestern part of the country, rendering the drainage and flowage for the cultivation of the cranberry both easy and cheap. Several parties are at the present time engaged in preparing the ground for the cultivation of this fruit, and from the success that has so far attended this branch of industry in other portions of the state there can be no doubt of its success.

Around the borders of the marsh, and bordering on the streams of water, are located very extensive hay lands, which must, in a very short time, be-

come valuable for hay and pasturage. Stock raising, except for home use, is yet in its infancy in the county. Still those who have engaged in this branch of industry have found it very remunerative. For all kinds of stock the climate is exceedingly healthy.

The lumber interest occupies a very prominent place in the resources of the county, giving employment to a large number of men, and creating a home market for a large part of the agricultural products of the county. The value of the lumber manufactured in the county last year falls but little short of \$500,000. It is floated down the rivers in rafts, and is chiefly marketed on the Mississippi river, in the states of Illinois, Iowa and Missouri. The logs are floated down the Lemonweir and Yellow rivers from the counties of Clark, Marathon and Wood. The supply of logs will last for a considerable number of years to come.

Only one line of railroad, the Milwaukee and St. Paul, is yet constructed through the county. This road runs east and west through the southern portion. Other lines, however, are projected, and some of them will doubtless be put in operation before the expiration of any great length of time.

Juneau county is well supplied with churches belonging to the various denomination, and also with public schools. The climate is healthy, and, upon the whole, it bids fair to keep even with its sister counties in population, wealth and intelligence.

KENOSHA COUNTY.

BY F. NEWELL, SALEM.

Kenosha county is strictly an agricultural county. There is little machinery driven by water power, and but five places deserving the name of village. Kenosha is the only place of trade of any note. Small places perhaps the germ of future villages, may be noticed at the different depots along the line of the Western railroad. In fact, at several of these depots, a large amount of trade has already sprung up, in cattle, sheep and swine, and the various productions of the farm. Warehouses for the storage of grain, superceding the huge buildings on the lake shore, have been built at several stations, and most of the marketing of grain is done at these places, so that little or no grain is shipped at the lake port.

At one of these stations a planing mill, a sash and door factory, a grist mill and a cheese factory are now in operation. Yet at the present time, the principal manufactures, aside from cheese making, are found at Kenosha. The productions of the different departments of labor during the past year, in Kenosha alone, at establishments which may properly be called factories, were valued at \$881,105.

The manufacture of lumber wagons may be considered the leading indus-

trial pursuit. The productions of these establishments at Kenosha are valued at \$348,855. At Wilmot, 150 wagons are yearly made, valued at \$12,000, one shop employing 150 men.

The two foundries at Kenosha produce \$200,000 worth of thimble skeins, boilers and repairs. At the tanneries \$163,550 worth of leather and skins was the product of 1870. Two malt houses give \$138,000 as their yearly product. Breweries \$28,000. The fishing interest at Kenosha, or adjacent thereto, are valued at \$12,476 yearly. Match factory about \$30,000.

Pressed hay, to the amount 1,750 tons, valued at \$26,250, is yearly put up. The lumber interest amounts to 8,000,000 feet of pine and 1,000,000 of hard lumber. 2,000 cords of wood and 3,000,000 shingles. One factory exports yearly 2,000 bales of flax, valued at \$12,000. The several establishments for the manufacture of boots and shoes for home and foreign trade is very considerable. The business at the different shops where harnesses and saddles are manufactured, is quite satisfactory to the manufacturers, and furnishes quite an item of trade in Kenosha.

The valley of the Fox river and the Des Plaine, together with the numerous small lakes and streams, furnish abundant water for grazing purposes; accordingly Kenosha county largely excels in the dairying business. Some 20 different establishments on the factory principle, are engaged in the manufacturing of cheese. Although some are in their infancy, yet about 687,000 lbs., were manufactured last year, valued at \$85,800. Other factories are soon to be started, and the dairy business will lead the agricultural interest of the county. In the above statement we do not include the farm dairying of the county. On very many farms, where several cows are kept a sufficient supply of cheese is made for home consumption. The amount of butter annually sold excels in value that of wheat.

The number of acres under the plow falls but little short of former years. But there are less acres devoted to wheat. The raising of corn is largely on the increase, not for export but to be fed on the premises. The beef, pork and sheep sent to Chicago last year by railroad, amounted to 150 car loads; in value, \$100,000. In addition to the above a large number of cattle, sheep and swine were driven to Milwaukee and elsewhere. Stock raising is beginning to attract the attention of the best farmers in the county. The thoroughbred "short-horns" are believed to be the best to cross with our native stock. The low price of wool has materially diminished the demand for sheep, and the number of fine woolled sheep has very much lessened within two or three years past. Yet, the value of the wool crop in Kenosha county amounted to nearly \$60,000 for 1870. It is believed, however, that the demand for wool will be sufficient to induce farmers to continue raising this important staple of our country.

The fruit of Kenosha county begins to attract considerable attention. Apples are yearly becoming more abundant, and as the soil becomes more drained and better tilled, the apple crop will be most certainly ample for

the wants of the community. At one mill there were 50 barrels of cider made last year, and 300 barrels in the whole county; a quantity sufficient to give every man, woman and child a bowl of "old orchard," relished perhaps by many next to "old rye."

Numerous attempts have been made to manufacture sorghum, but that branch of labor is nearly abandoned. Every year new branches of trade and manufacture arise, adding another demand for labor, and opening new channels for investment; among these may be found the manufacturing of cheese-boxes.

It would exceed the time and space we designed to fill to particularize the trade in fanning mills and pumps, which furnish labor for a number of men, and articles for the surrounding country. Suffice it to say, the genius of the American people will never fail to find new sources of employment, when old ones become overworked or non-productive.

KEWAUNEE COUNTY.

BY HON. LYMAN WALKER, AHNAPEE.

Kewaunee county is situated on the shore of Lake Michigan, 110 miles north of Milwaukee. Its coast is lined with harbors, from which the products of its industry are readily shipped to market; in consequence of which the producer realizes better prices, and more ready sales for the results of his toil.

The quality of its farming lands is excellent, and all kinds of grain and vegetables are successfully cultivated. Winter wheat, especially, does well here. The following are some of the leading agricultural productions for the year 1870; wheat, 200,000 bushels; oats, 150,000 bushels; Barley, 100,000 bushels; rye, 50,000 bushels; potatoes, 100,000 bushels; hay, 25,000 tons; butter, 100,000 pounds; wool, 20,000 pounds.

The county is heavily timbered; the varieties are principally maple, beach, oak, basswood, elm, cedar, pine, hemlock and tamarack. Owing to its facilities for water transportation, lumber and timber find a ready market, and consequently its exports are principally of this kind. The following figures show the amount of business done in this line: The amount of lumber exported the past year was, 20,000,000 feet; shingles, 12,000,000; cedar posts, 600,000; railroad ties, 350,000; telegraph poles, 10,000; cordwood, 20,000 cords; tan bark, 12,000 cords. The ready sale of these articles enables the settler here to earn a comfortable living while clearing up his farm.

The population of the county is 10,281; most of these are foreigners. The large amount of unimproved land, possessing in its excellent timber, its fertility, and its accessibility to market so great advantages, presents

strong inducements to those who are seeking western homes. Improved lands are held at an average price of \$15 per acre; unimproved, \$5 per acre. About 21,000 acres still belong to the state, which can be bought at less rates.

LA CROSSE COUNTY.

HON. CHARLES SEYMOUR, LA CROSSE.

The state of Wisconsin, which probably has a larger diversity of interests, and embraces a greater variety of elements of wealth, than can be found in any other state of the Union, or in any country or province in the world of similar dimensions, is appropriately represented by the county of La Crosse, which contains, at once, the richest and poorest of soils, superior grazing and tillage lands, accessible and competing markets, thriving manufacturing establishments, eastern and western rail, and northern and southern water transit, and an intimate affiliation with a commerce that is national in its character, and which has a tendency to foster and develop many important branches of industry, and to give well requited employment to its present and future population. The marked progress of the eastern or agricultural half of the county, in respect to stock raising, is gratifying to every one who likes to see good cattle, sheep, horses, etc., in the place of inferior animals.

The dairy, as a branch of agriculture, has received considerable attention, and has been satisfactory and profitable to all concerned. The county has little prairie land. The choice farms in all directions are in valleys of exceeding richness; and from the bold bluffs, which are perpetually washed by rain in spring, summer and autumn, and by snow in winter; to enrich the valley lands, living springs send out generous streams of the purest water. The tiers of Wisconsin and Minnesota counties on the Mississippi river, although rough, are remarkably adapted to stock raising and dairy purposes. While these valley farms are perpetually replenished by the wash from the bluff slopes, the latter are kept in deep verdure by the moisture caused by great and sudden disparity in the temperatures of water, land and air, and by the invigorating ammonia produced by the late autumn and early spring fires. These bluffs are thus self-constituted fertilizing agents to strengthen the valley farms for the heavier task of yielding generous crops. Vegetation in La Crosse county, on the first of June, is usually as far advanced as it is in northern Illinois and northern Indiana two or three weeks later.

In reference to home markets, it is gratifying to notice in and at the city of La Crosse, with a population of about ten thousand, which is one half of the entire county, increased attention to manufactures, which give employ-

ment to large numbers of skilled artisans, who become valuable consumers of farm products; and thus between the demands for home consumption, and for Southern and Eastern markets by water and rail transportation, the farmers have a choice of markets. This serves to illustrate the substantial benefits derived by farmers from proximity to manufacturing establishments, and demonstrates the existence of a permanent bond of sympathy and a mutual interest between these two higher branches of industry. The lumbering interests of the Black river have their seat, center and market of purchase, sale and supply at La Crosse; and from this source alone, manifold benefits accrue to the agricultural producers of this and contiguous counties. The largest, safest and best ship-yard between the mouth of the Ohio river and the Falls of St. Anthony is located in the well-protected harbor between La Crosse and the mouth of Black river. It is the headquarters of the larger fleet of steamers and barges employed in the navigation of the Upper Mississippi and its tributaries. It is a valuable item in the commercial elements of this vicinity, as the products of the soil and forest, and the skill and labor of mechanics are in large request during the winter season, when navigation is suspended; and when, in other localities, there is, comparatively, a depression in business. Thus, it will be seen, that La Crosse city and county are favorably located, constituted and occupied, with reference to agricultural and other industrial interests; and that with railroads reaching east and west, and river navigation north and south "everything is lovely."

Education is not neglected, but receives vigorous attention. The character of our inhabitants, the majority of whom are accustomed to, and fully appreciate the value of popular education, would insure due regard to this most important feature of a well ordered community. As to the press of La Crosse, it is safe to say that liberally patronized and enterprising newspapers, published in the English, German and Scandinavian languages, have long been in successful operation.

With so many elements of strength and influence actively employed, no one need be surprised at the steady and rapid progress of the city and county of La Crosse. Without boasting, it may be truthfully said, La Crosse is one of the live, progressive, enterprising, prosperous points in the west; and the solidity, beauty and magnificence of its private residences, public edifices, and business establishments, would be interpreted by any intelligent observer as palpable evidences of wealth and refinement. The recent discovery of a considerable quantity of bituminous coal of a superior quality, at a depth of about forty-five feet from the surface of the ground, where three German farmers were digging a well on the side and near the base of one of the bluffs, about four miles east of La Crosse, establishes beyond all controversy, the fact that Wisconsin has coal of a good quality, and it is hoped that measures will soon be adopted to develop this important resource.

LA FAYETTE COUNTY.

BY HON. H. H. GRAY, DARLINGTON.

The last decade embraces the most important period of agricultural prosperity in this county. Notwithstanding it is the first settled part of the state, twenty years embrace the existence of all its industries, except mining. In 1827 the present county limits contained one-third of the population of the state. Farms were opened only in a few places near old military stations, or smelting furnaces, or by miners making mining the principal occupation. The Rock River valley as late as 1847, furnished a large share of the meat and bread consumed in this county.

When the agriculturist began in earnest, husbandry was more diversified than in any other part of the state, owing to the demand of a large non-producing class requiring variety at the start. In 1860 it was estimated that there were 8,500 persons dependent on the lead mines for support. Starting later in agricultural development than the other counties in the southern portion of state, it now ranks with any of them in its improvements and the wealth of its inhabitants; it compares favorably with any county in the state in school and county buildings—having erected a poor-house for the accomodation of the indigent and insane at a cost of \$30,000. Roads are much looked after, while the public bridges exceed most counties in the state for architecture, beauty and durability.

Excellent water-power abounds in most parts of the county, with a sufficient number of flour mills thereon to meet the wants of the people. Wood for fuel is increasing faster than the consumption, the price of which has fallen 30 per cent., in ten years.

The agriculturists of the county were impelled by a desire to speedily realize the largest amount of money, to pay for the farm and subsequent necessary improvements, thereby keeping themselves on the lookout for changes in the market, to the neglect of the laws of nature; the consequence has been weeds and short crops; but being still young in farming, and new in soil, they are now regarding the future as well as the present.

Our farmers have given themselves up almost entirely to wheat-raising; more care is being given to variety sown, and to the preparation of the soil; but the yield is decreasing every year; less upon new ground as well as old. Exhaustion of some chemical agent cannot be assigned as the reason for short crops, it is in the climate or deterioration of the grain seed; the stalk is not so vigorous, the heads less numerous, the kernel smaller and the bushel lighter than was the case fifteen years ago. Wheat from Pembina, St. Paul, New York and southern Illinois has been experimented with. There was a marked excess of the southern Illinois over any other for the first year; the second year (1870) did not give a true test owing to dry weather. This is contrary to the prevailing opinion of most farmers. Not-

withstanding the great falling off in yield, our people insist that they are in the favoring wheat belt of this continent, and continue to raise it. A comparison of views seems to settle in favor of early deep plowing in the fall for prairie soils, and shallow spring plowing for the barrens. Early broad-cast sowing on old ground, and drilling for new ground, with early cutting and sweating in stack instead of in barns; and that well rotted manure brings even standing, medium sized stalk, with large heads, while long manure makes uneven grain, with short heads but plump berries.

The oat crop has been very profitable, owing to the Southern market during the war. Experiments with oats have been confined to varieties instead of any new preparation of soils. They have generally been sown upon old ground, after wheat and corn had first drawn from the vegetable mould. I have tried all the new kinds in the market, and this year had an astonishing yield from a German oat, but do not believe that, with like cultivation and care, any oat will excel the black oat that has been raised in this part of the state for thirty years.

Barley has been the most popular and unpopular of all the cereals raised by our farmers, owing to the great variations in the prices. It has in the last ten years varied from twenty cents to two dollars per bushel.

Rye has been generally regarded as the poor man's crop, as well as the crop for the poor field, until within the last few years. The price has kept very uniform, and next to wheat, the yield being double that of wheat, and it is now considered one of the best crops.

Flax is raised for the seed, no use being made of the straw, except that a few tons have been shipped for manufacturing purposes.

Our farmers are fast going back to the old threshing floor. Experiments have fully demonstrated that grain can be threshed cheaper with a flail than with a machine, besides saving the straw in a better condition to be fed to stock. It also cheapens the labor on the farm the year through by giving twelve months' employment instead of six. We would not waste a single muscle by putting it in competition with machinery, but circumstances attending many farm communities creates a preference for hand threshing over the machine.

Much attention has been paid to the root crops. The potato, owing to a good market south, has commanded a good price, and consequently has been largely cultivated. Many new varieties have been experimented with; the rage has quite equaled the hop fever. This county claims to understand potato culture, and regards it as having yielded the best results of anything put into the ground. The English farmers cling with tenacity to the turnip, which is by them regarded as essential to good husbandry; while the American farmer cultivates the carrot, as more nutritious and less bulky.

Plowing matches among our English farmers are one of the best features of all improvements going on in the county. The match for 1870 was one

of the most picturesque assemblages of the bone and sinew that has ever met in the county—surpassing in interest the annual agricultural fair.

We have been more successful in the cultivation of fruit than most of the counties of the state. A great variety of apples, are exhibited at our annual fairs. The apple crop of the county supplies most of the demand for home consumption. From 1855 to 1860 many things combined to injure fruit and fruit trees, but since that time there has been a marked improvement in the general health of the orchards, as well as an increase in the yield. The bark louse has entirely disappeared in a large number of the old orchards, thereby indicating an improved condition in the health of the trees.

Our experience on location is in favor of dry soil, and shelter from the wind. Upon north and south exposure we have the experience of two farmers, who thirty years ago planted each two orchards, facing north and south. To-day there is no difference in the four orchards; about half of each are dead, of the remaining trees twenty-five per cent. give signs of speedy decay, the remainder look healthy. Prospects are very flattering that our farmers will soon enjoy all the fruit from the apple tree that their wants demand.

Some varieties of plums succeed. Pears have been grown of a very fine flavor; the cherry promises but little; the peach has several times been brought to the highest perfection in fruit, but immediate death followed the first fruiting; grapes are grown in great abundance, their culture on a small scale is quite general.

An unusual degree of interest has always been manifested in the breed of horses. The early habits of the people led to the introduction of the race horse, both for the turf and the saddle, the breeding of which was pursued with much expense. Upon the decline of lead-mining consequent upon the discovery of the gold mines, the turf was abandoned, the high prices paid for half bloods soon removed our fast horses which were replaced with larger animals. We are now breeding the heavy Norman horse, and the race horse—good breeders endeavoring to maintain the breeds distinct.

We have, according to late statistics, an excess of mules over any county in the state. Mostly the growth of the last ten years, but owing to a fall in prices and their disagreeable company on the farm their rearing has been mostly abandoned.

The first thorough-bred cattle brought into this state were kept in this county; this was about thirty years ago; but they were not in the hands of practical farmers, and were soon lost in indiscriminate crosses with all kinds of natives. We now have a number of herds of Durhams, a few Devons and Alderneys—the Durham chiefly. We still are unsettled as to the respective merits of the Durhams and our native cattle. It is claimed that like care bestowed upon the native will give as good results in beef,

and greater results in butter and milk. A few Aldernys have been tried, but do not succeed in gaining friends, either by their beauty or milk qualities. Our farmers decide that cattle raising, only as a part of mixed husbandry, does not pay. A number of cattle sufficient to consume the corn-stalks and straw, with a small amount of roots and grain, is all that our long winters will permit to be profitable. Our farmers have been in the habit of selling off their cattle at two and three years of age, but find this is bad management, and now keep a few until they are four and five years old.

Sheep have done remarkably well. After learning from our punishment from the merino, our farmers introduced the long wool sheep of different varieties, from Canada, and are doing well. Our soil is well adapted to sheep husbandry.

The long prevailing high price of live hogs has stimulated hog raising beyond all precedent. The breeds have been thoroughly tested. The county abounds in all of the choicest breeds of hogs, in great numbers.

Although agriculture has become the leading industry of our people, there is yet a large number engaged in lead mining, which is carried on with more system than heretofore. Lead ore is found in all positions in the earth. So eccentric is the geological formation of the lead bearing district, that no rule can be given that will apply to all sections, but lead is found principally in crevices in the rocks, mixed with clay and sand. Sometimes fused into the rock, it is found as pure Galena, and combined with several metals, with sulphur, with several of the acids, oxygen and carbonic acid. A well grounded opinion prevails among those who have examined the mines of this and other countries, that by far the heaviest yield of lead will be found lower down in the lower magnesian limestone. Several attempts have been made at deep mining, but have failed reaching any great depth. We entertain a firm belief that the whole county is underlaid with heavy deposits of this ore. Copper has been worked with but little success. The green carbonate abounds in small quantities in the north part of the county. The carbonate of zinc is found in most of our lead shafts, and has been thrown away by the miner as of no value, but works have been established in Iowa county, this state and at the coal mines in Illinois, where it is being manufactured into white paint.

MANITOWOC COUNTY.

BY HON. CARL H. SCHMIDT, MANITOWOC.

On the western shore of Lake Michigan, about midway between Chicago and Mackinaw, is the county of Manitowoc. It contains 365,861 acres of land, of which 128,649 are improved. The population, according to the

last census, is 33,369, most of whom are of foreign birth, principally Germans.

The surface of the land is rolling, and well watered by rivers, creeks and small lakes. The rivers are comparatively short, the distance between Lake Michigan and Lake Winnebago being only forty miles; but they furnish splendid water-powers, and are mostly navigable for logs. The climate is milder in winter and cooler in summer than in the western part of the state. Spring commences later than further west, but the fall fully compensates for this loss.

The lands were originally covered with timber, partly pine, partly oak, maple and beech. The pine has been cut away, but there is a good supply of hard wood yet, for firewood and manufacturing purposes. The timber is cut and shipped to Milwaukee and Chicago markets.

In a timbered country the clearing of the lands and the cultivation of farms is more difficult than on prairies, but the lands fully repay for the amount of labor expended on them. Our farms are therefore small, but well cultivated. The main products of the county are wheat and other cereals; the yield is not only large, and the crop sure, but the quality is superior. The amount of wheat produced in 1870 was 523,985 bushels; of rye, 93,742; of oats, 378,840; of barley, 30,155; of potatoes, 109,018 bushels; of wool, 51,963 pounds; of butter, 578,106; of cheese, 4,412; of hops, 1,200 pounds, and of hay, 26,744 tons. A large area is sown with winter wheat, which yields well and is very seldom killed by frosts. Corn, however, is grown very little, the summer not being warm enough to ripen it. Flax and rape seed are cultivated somewhat, for home consumption; peas are extensively grown and exported; onions, potatoes and roots grow well; and command good prices. The country being partly timbered yet, and well watered by streams and creeks, crops are well protected against drought, as well as against the storms.

Stock is not grown so extensively as in prairie countries. Enough stock is kept, however, to supply the home market with meat, and some for export. The stock has been materially improved during the last few years, and the good work is still going on.

The cultivation of fruit trees attracted the attention of our farmers at an early time, and much money has been expended in planting orchards, but until lately all attempts have failed, and it was generally supposed that the soil and climate of our county was not adapted to fruit growing. These failures however did not discourage every fruit-grower, and for the last ten years orchards have been planted with great success. The failure in former years may partly be attributed to the uncultivated state of our soil, but more generally to the selection of trees not adapted to our climate.

Grapes are only raised in very limited quantity, but it has been proved already that they may be grown in sufficient quantity to supply the home demand. Small fruit, as gooseberries, currants, raspberries, strawberries, etc., grow excellently, as well wild as cultivated.

Splendid water-powers, abundance of raw material for manufacturing purposes, cheapness of fuel and cheap and convenient means of transportation, early induced manufacturers to locate here. The first establishments were for the manufacture of lumber. The supply of logs, however, has been nearly exhausted, and a number of saw-mills have therefore been transformed into other establishments. Numerous tanneries located throughout the county have materially assisted in developing its resources.

The large and almost unexhaustable supply of timber has induced the establishment of factories of wooden-ware. The most important are the pail factory in Two Rivers, turning out cargo after cargo of tubs, pails, etc.; a large chair factory at the same place, giving employment to a very large number of men, and manufacturing furniture of all kinds. Three other chair factories are in operation at Manitowoc. The manufacture of staves has been successfully commenced. A factory for the manufacture of flour barrel staves has been in operation for five or six years, and is using a great quantity of timber. Sugar barrel staves and headings are also manufactured in large numbers, and shipped via Chicago and the Mississippi river to Cuba. Staves for pork and whisky barrels, beer kegs and large casks are made. Broom handles, hubs and spokes are also largely manufactured. The manufacture of wagons, buggies and agricultural implements has scarcely begun, although a small supply of really superior articles in this line are turned out.

Two woolen mills are in operation in this county. Both manufacture a superior article of cloth and other woolen goods, and consume large quantities of wool. Flouring mills have been established in all parts of the county, and are doing a good custom business, and are turning out large quantities for shipment. A glue factory at Manitowoc makes a good article of glue, which finds ready sale. Planing and turning mills are in successful operation; also establishments for the manufacture of furniture, boots and shoes, clothing, tin-ware, etc. A better place for the establishment of manufactories cannot be found than this, where raw material is so plenty and cheap, where sites with the requisite power can be had at reasonable rates, and shipments can be made to all parts with great facility.

The splendid supply of white oak timber early gave rise to a good ship-building business at this place, which has largely increased since the Goodrich Transportation Company commenced building their steamers at this point. Upward of fifty men are constantly engaged in ship building, and the superior quality of Manitowoc built vessels has won for our city the name of "Clipper City." Vessels are built here, not only for our own marine, but for that of other ports.

A good business is done in repairing and rebuilding vessels here, that put into port disabled by storms. When the dry dock, now building, is completed, this business will be very materially increased. The shipment of raw material, the product of our forests, and the products of our agricul-

ture and industry, is creating a lively trade and greatly advances the wealth of the county. Our main product, wheat, and other cereals, pork, butter, etc., are mostly shipped to Milwaukee, but some provisions, hay, etc., are sent to Lake Superior and the pineries of Michigan. Our leather is shipped to Milwaukee, Chicago or Boston, most of the other products to Milwaukee and Chicago only.

The following list of shipments from the port of Manitowoc along, and embracing only a few main articles, will give an idea of the importance of our commerce even at this period:

Bushels of wheat shipped in 1870.....	284,396
Barrels of flour.....do.....	14,610
Cords of wood.....do.....	12,965
Railroad ties.....do.....	45,900
Feet of lumber and timber..do.....	6,000,000
Rolls of leather.....do.....	3,460
Staves and barrels.....do.....	675,000

A great deal is shipped from Two Rivers, and the different piers built all along the lake shore. There are twelve or more such piers in the different towns along the shore; shipments from them not only are of great value, but enable our farmers to sell the timber on their lands at a fair price, instead of burning it as has to be done in the more western towns.

Regular lines of steamers and propellers run between Chicago and lake Superior and intermediate ports, all stopping at Manitowoc. The lines from Chicago to the east also call regularly, giving to our merchants the benefit of a direct and cheap freight to and from the east; 498 steamers and propellers arrived and departed here during the year 1870. The bulk of shipping, however, is done in sailing vessels, of which our merchants and shippers own about thirty of various sizes.

To the shipping interest the excellent harbor at Manitowoc is of the greatest importance, as well for taking and discharging of freights, as for protection from rough weather. Situated in a large and beautiful bay, five miles from point to point and three miles from the point to the inner shore, the bay is well protected against dangerous storms, and presents a good anchorage. It has been improved by the government at a cost of \$150,000, and is one of the best, if not the best harbor on lake Michigan; it is accessible in all weather, and in all seasons. A good light-house is maintained by the government. At the last session, congress also made an appropriation for the purpose of improving the harbor at Two Rivers. This port is situated near the north point of Manitowoc bay; and the improvement of its harbor is of the greatest importance.

In 1870 the county voted aid, to the amount of \$250,000, to three several lines of railroad—one to Milwaukee, one to Appleton, and one to Green Bay. The building of these several roads has now been secured and will connect us with the leading roads of the state. Work has been commenced on the western road to Appleton.

Manitowoc, on the mouth of Manitowoc river, is the only city in the county. It contains 5,168 inhabitants, 4 public and a number of private and parochial schools, 11 churches, 4 newspapers (2 English and 2 German), 6 tanneries, 3 flouring mills, and a great number of other manufacturing establishments. Two Rivers is an incorporated village, with 1,365 inhabitants, one public school of high standing, several churches and large manufacturing establishments.

The county contains 33,369 inhabitants, according to the census of 1870, being an increase of 10,953 since the census of 1860. The value of the agricultural products is estimated at \$1,450,271; that of manufactured products at \$1,561,579, a total of \$3,011,850.

MARATHON COUNTY.

BY B. RINGLE, WAUSAU.

Marathon is the largest county in the state. It is one hundred and twenty miles in length, and 54 in width, and contains about 4,000,000 acres of land. The Wisconsin river runs through the centre of the county from north to south, and with its numerous tributaries affords abundant and reliable water power.

The first white settlers of the county were lumbermen, who came here about the year 1840. Farmers first began to settle in this county about the year 1856, and since then there has been a steady increase of our farming population. The county now contains about 7,000 inhabitants, two-thirds of whom are German.

The chief occupation of our people is agriculture and lumbering. The timber along the streams is principally pine and hemlock, and on the high lands or ridges, sugar maple, oak, elm, basswood, ironwood, butternut, ash and birch. The soil of the county is very rich, and well adapted for agricultural purposes. It is generally heavy loam, resting on clay, and covered with vegetable mould. Grain of every variety is grown here, especially wheat, rye, oats and barley, with success, while potatoes and all root crops are cultivated in large quantities. All kinds of garden vegetables that can be raised in the state grow luxuriantly here. The average crop of wheat is from twenty to thirty bushels per acre, though as high as fifty bushels have been raised. Oats yield as high as seventy bushels per acre, and of the best quality, often weighing as high as forty-six pounds to the bushel. Potatoes yield from 400 to 600 bushels per acre.

An agricultural society was organized in this county three years ago, and has held annual fairs with great success. The exhibition of products, stock and manufactured articles were very creditable, both in quantity and quality. Although agriculture in this county is too new to be in the highest state of

perfection, still there are many farms that will bear favorable comparison with those of almost any other county. There are not over 50,000 acres under cultivation, which is less than one-twelfth of the tillable land.

This can hardly be said to be a fruit growing county, although it has been fully demonstrated that some varieties of apples, pears, plums and grapes can be produced. Small fruit, such as raspberries, blackberries, and plums grow wild in large quantities.

The principal articles of manufacture of this county are lumber and shingles, which also constitutes our chief exports. There are twenty-four saw mills in the county, which annually manufacture from seventy-five to one hundred million feet of lumber; and the almost inexhaustible pine forests on the upper Wisconsin and its tributaries, will furnish our people a field for this valuable production for another generation. There are also three gristmills in the county which manufacture flour as good as is found in the state.

Wausau is the principal business place in the county. It is beautifully situated on the eastern bank of the Wisconsin river, and contains about 2,000 inhabitants. There are several other villages growing up in the county which are destined to become prominent business points.

This county affords great inducements to actual settlers. Choice lands can be bought at from two to three dollars per acre, and the pineries afford a good market for all farm products. Our farmers do not yet produce one-half the provisions consumed in the pineries, and will not for some time. The climate of the county is remarkably healthful. The atmosphere is dry and pure, and the water is soft, pure and abundant.

MARQUETTE COUNTY.

BY HON. S. A. PEASE, MONTELLO.

The whole county is openings and timber; the soil is diversified; clay and loam, with considerable sand, and extensive marshes furnishing abundance of natural meadows and pasture. The county is well watered with springs, small creeks and large mill streams. There are ten flouring mills, four woolen factories, two sawmills and one iron foundry in the county. Fox river runs through the county from east to west, with two thriving villages upon its banks—having four warehouses for grain and other shipping purposes. There are nine villages in the county, all of them well supplied with business houses, and well patronized.

Montello is the county seat, with a large and commodious court house, built of stone and brick, two churches, stores and mechanics shops, two flouring mills, and a woolen factory. Montello is situated upon Fox river, where we have a regular line of steamboats from Berlin down the river.

The Montello river, a large mill stream, empties into the Fox at this place, and furnishes power for one-half mile of machinery, which is not one-fourth part improved. The inhabitants are made up of one-third Americans, one-third Germans, and one-third Irish. A large majority of the settlers came in poor, and are now in good circumstances, some of them getting rich. Land is worth from five to fifteen dollars an acre; and there can yet be found good chances for several hundred families to make good homes, with a very little money. In less than three years we expect to have from one to three railroads running into or through Marquette county, which with the ship canal along the channel of the Fox river, will give Marquette county transportation and market facilities, not excelled by any county in the state.

The people in this county are healthy and happy, and others who come amongst us to live, will be made to enjoy all the blessings we have enumerated.

MONROE COUNTY.

BY D. MCBRIDE, SPARTA.

Monroe county was organized as a county in 1854, and at its first election cast less than one hundred votes. By the late census of 1870, it appears that there are now twenty-one organized towns in the county, containing a population of 16,552. It has 402,070 acres of improved lands, the appraised value of which, on the assessment roll, is \$1,783,524. The appraised value of its village lots and houses is \$853,659. The following table shows the quantity and value of personal property:

Articles.	Value.
3,767 horses owned.....	\$205,412
12,265 neat cattle.....	192,377
146 mules, asses, etc.....	9,257
13,134 sheep.....	17,271
7,175 swine.....	22,969
2,650 wagons, carriages, buggies, etc.....	67,650
Bank stock owned in the county.....	52,180
Merchants and manufacturers stock.....	224,416
All other personal property.....	188,945

Its soil is varied; a large portion of it of a sandy character, the balance loam and clay. The half west of the dividing ridge is composed of ranges of bluffs and valleys; the valleys are exceedingly rich and productive, producing the best spring and winter wheat in the state, while it also produces excellent grass, clover, etc. Dairying is now attracting the attention of many farmers in the county, and several cheese factories have gone into successful operation during the past year. The price of improved land varies from \$15 to \$50 per acre. All the valleys are well supplied with beau-

tiful streams of pure spring water, well stocked with speckled trout and other small fish. There are two artesian wells at Sparta, the county seat, one of which has strong medicinal qualities, and the other has magnetic properties; both are found to be beneficial for health, and have cured many chronic and other diseases. The air is pure, healthy and invigorating, and the scenery delightful.

MILWAUKEE COUNTY.

(From the Immigration Pamphlet of 1870.)

This county contains about 152,000 acres of land, of which about 9,000 acres lie within the corporate limits of the city of Milwaukee. Four-fifths of the entire amount of farming lands are under improvement, and together with the unimproved lands, which are mostly timber, and often more valuable than the improved, have an average value of \$75 per acre.

The present population of Milwaukee county (1870) is 89,936, of which the city of Milwaukee contains 71,461.

As there are no public lands in Milwaukee county, its statistics will be chiefly interesting to immigrants, as they set forth the opportunities for procuring a livelihood in the different mechanic arts and the occupations attendant thereon.

To the skilled artisan who intends to emigrate and follow his calling or occupation, the city of Milwaukee affords employment to large numbers in its foundries, machine shops, its furnaces and rolling mills, railway repair-shops, in the manufacture of furniture, of barrels and all description of cooperage, of boots and shoes, of clothing, and the numerous other, no less useful but minor handicrafts.

For the common laborer, employments are to be found on the docks, in the lumber yards, breweries, freight warehouses, grain elevators, on its railways; in the stores of the wholesale merchant, and the various labors incident to the building up of a young and flourishing city.

The annual report of the Chamber of Commerce for 1869, shows the assessed valuation of real estate and personal property in the city of Milwaukee to be \$43,493,313. In extent of marine commerce it ranks as the fourth city in the United States. The number of entries at the custom house during the year were 4,878, with a total tonnage of 1,974,119 tons, and of clearances 4,877, representing an aggregate tonnage of 1,938,414 tons.

The receipts of grain for the year 1869 were 19,407,054 bushels, of which 17,745,238 bushels were wheat.

The receipts of flour were 807,763 barrels, and the amount manufactured in the city 481,511 barrels; total 1,289,274. The shipments of wheat to eastern and Canadian markets during the year amounted to 14,272,799 bushels, and of flour, to 1,220,658 barrels.

The total number of hogs packed in the city during the season just closed was 175,000.

The total receipts of foreign merchandise, exclusive of railroad iron, pig-iron, salt, plaster, and coal received at Milwaukee during the year 1869 were 111,256 tons.

Of railroad iron there was received 31,601 tons, 9,000 tons additional were manufactured there, making a grand total of 43,601 tons, worth \$80 per ton, the sum of \$3,488,080. 12,180 tons of pig iron were received during the year, and 4,695 tons of iron ore.

Thus it will be seen, very succinctly stated, the business annually transacted in the commercial emporium of Wisconsin, and which is annually increasing with that marvelous rapidity incident to the rapid settlement of the western world.

Milwaukee contains between fifty and sixty churches, belonging to various denominations, has nine large and elegant public school buildings, where the children of the poor and the rich are alike educated free of expense. For salubrity of climate it is unsurpassed in location, and the annual death rate per thousand is less than that of either of its neighbors, Chicago or St. Louis.

Situated as it is, with its great facilities for lake commerce, and the thousands of miles of railways radiating throughout the great northwest, it cannot fail to continue to be, what it now is, the commercial emporium of Wisconsin, and one of the three great business centers of the northwestern United States.

OCONTO COUNTY.

(From the State Immigration Pamphlet for 1870.)

Oconto county comprises that portion of northeastern Wisconsin most valuable for its timber and farming lands, its immense and unrivalled water power, its mineral deposits and fisheries.

It is bounded on the east by the waters of Green Bay and the Menomonee river, the first navigable for sail vessels and steamers of the largest size, having a shore of about forty-five miles in Oconto county, and receiving in and from the same county, three large rivers and several smaller rivers and streams.

Oconto county embraces an area of over five thousand square miles. It is estimated that the unsettled portion of the county, about one-third of the area, is covered with pine and hemlock, one-third with sugar maple, and other hard woods, and the remainder with cedar, ash, elm, tamarack, and such timber as is usually found on alluvial soils. Almost the whole surface of the county is traversed and drained by numerous streams.

The southeastern portion of the county is rolling, and, near the shore of Green Bay, level; the northwestern portion more broken and rocky.

About twenty years ago the county was almost an unbroken wilderness. A single saw mill on each stream, no road traversing the county, and no farmers. Now the county is traversed by three principal roads from south to north and numerous roads intersecting the towns in every direction, and making accessible the pine and farming lands of the county. The single saw mills have grown to a family of giants, fashioning into boards and timber the huge pines as fast as three thousand men and a thousand teams can bring them, and a hundred ships carry the lumber away.

The population of the county is 8,322, a majority of whom are foreigners. The largest portion of the county is still owned by government, as the investment of capital has been almost wholly confined to pine lands. The government sells its land at from seventy-five cents to one dollar and twenty-five cents per acre. The actual settler has the right of pre-emption to one hundred and sixty acres for one year before he is obliged to pay for his land. But to the homestead act this region owes much of its late rapid growth and prosperity. Lands in and about the settlements are for sale at from two to five dollars per acre. The climate is healthy and the winter has advantages which fully compensate for its length.

The northern portion of the county is rich in mineral deposits, which are destined to become a most important element of prosperity. A very considerable branch of industry must soon grow up by the establishment of blast furnaces. The rivers and streams traversing the county are used at present mainly as highways over which float the logs and timber for the different mills. They afford also unlimited water power, the value of which is just beginning to be appreciated. For the manufacture of almost every article in wood, for saw mills, grist mills, tanneries and factories, we have almost at our doors, an abundance of cheap motive power.

As a grain growing county, its reputation is established. A more certain harvest, a good and even yield, plump berries with more and better flour, are had here than in more southern latitudes. The grass crop is one of the most profitable. Worth from eighteen to twenty-five dollars per ton, at present, hay must in the future command nearly or quite as good a price as now. It is estimated that over one thousand tons are annually imported into this county. A large portion of the present supply is taken from the natural meadows and of course is inferior in quality. A much smaller quantity of the wild grasses would be used, and no hay would be imported if the home supply was sufficient. We have cheap and excellent hay lands, but not hands enough to seed them down and get the grass crop started.

The consumption of slaughtered cattle is very great, and it is a very noticeable fact that our own beef dealers are securing land and feeding their own stock. At a low estimate, we import one hundred and fifty thousand

bushels of grain per annum for working horses and cattle alone, which could be more profitably raised here. Of grain or grass, it may be truthfully said, that either for home consumption or export, it can be raised with profit in Oconto county. The root crops are unexcelled anywhere, and with deep and careful culture yield enormously. Apples, cherries, plums and grapes do well. The smaller fruits mature finely and yield abundantly.

OUTAGAMIE COUNTY.

Agriculture is the prominent interest in this county, for which the configuration of its surface, the fertility of its soil, and its accessibility to market are especially adapted; yet it has equal facilities for manufactures, which will be fully developed at no distant day. The water power furnished by the lower Fox, which passes through its southeastern corner, and by the Wolf river and its many tributaries, are unexcelled, either in extent or availability. It has also an abundance of material for manufacturing purposes in the heavy timber with which a large portion of the county is covered.

The county has an area of sixteen townships, of which 75,935 acres are improved. The soil is principally a black loam, with a subsoil of stiff clay. There is considerable low, or swamp land in the county, but a large portion of it is susceptible of drainage, and will eventually become the most fertile and productive land of the state. Wheat is largely cultivated; the census returns of 1870 give a total of 353,187 bushels. Next in importance are oats and corn; of oats, 200,000 bushels were raised; of corn, 56,331 bushels; potatoes, 66,725 bushels; wool, 34,799 pounds was grown; butter, 282,704 pounds were made. The sum total of our agricultural productions foot up \$1,788,224. The population of the county is given as 18,440.

Appleton is the leading city of the county, and is the seat of a large manufacturing business. It has a population of about 5,000.

The Fox river in its present condition furnishes a good outlet for the productions of a large portion of the county; but when the proposed ship canal is completed and the railroad connections are made as contemplated, we shall have as good and direct market facilities as any portion of the state. The county presents rare inducements to all who are in search of cheap but fertile farms, for pleasant, comfortable homes; or for opportunities for the investment of capital in manufacturing enterprise.

OZAUKEE COUNTY.

BY J. W. JOHANNES, CEDARBURG.

The population of this county is 16,000, mostly all of foreign birth. Its principal products are wheat, rye, oats, barley, peas, beans, buckwheat, corn and hay. 85,000 acres are under cultivation, yielding last year an aggregate of 400,000 bushels of wheat (averaging $22\frac{1}{2}$ bushels per acre), 100,000 bushels of rye, 30,000 bushels of corn, 300,000 bushels of oats, 80,000 bushels of barley, 100,000 bushels of potatoes, 40,000 tons of hay (most timothy), 6,500 bushels of buckwheat, 7,000 bushels of peas, and 15,000 bushels of white beans, and various small products.

The land is some of the best in this state; it was twenty-two years ago a primitive forest of heavy timber, such as maple, beach, bass, white and black ash, butternut, oak, etc.

Fruit raising is yet in its infancy, but is fast becoming what it should be; every where you see young orchards of apples, pears and cherries. The apples raised here are in quality better than the eastern, in quantity they excel all I have seen in this state.

Stock raising has been very much neglected, but few have choice stock; most have mixed stock, and it defies the best judge to class them. Farmers were aiming only to raise wheat, etc., but now they are turning their attention to stock, because they see that they cannot work their farms many years longer without manuring the land, and on account of the high price of beef. Raising horses is better developed; the finest race horse and the strongest farm horse are bred. Hogs are largely raised. The Chester White is the favorite. Sheep breeding is in a poor condition; the amount of wool raised was 20,000 pounds, of a coarse quality. Our farmers have a good market for their wool at Cedarburg woolen mill, always getting more than the market price.

Our quarries consist of white sand stone; seven are in successful operation. The Milwaukee and Northern Railroad runs through the quarries, furnishing the best facilities for shipping the stone. There are eight grist mills, with thirty run of stone, turning out the best kind of flour. One woolen mill with three set of spindles, and capacity of 120,000 pounds of wool, employing forty-five hands; six saw mills; five tanneries; three brick yards, making celebrated yellow brick; two cheese factories, making 10,000 pounds per year; eight shoo shops, employing fifty coopers; fifteen wagon makers' shops, with sixty hands; two foundaries; seven breweries, and various other manufacturies; seventeen churches, of different religions. The new Catholic church, in Cedarburg, is the finest edifice in a country town in the state—cost of building \$40,000. The public buildings are in excellent condition. Our taxes are low compared with those of neighboring counties. All towns, having villages in their limits, have comparative

good schools, but in most of the towns without villages, the schools are sadly neglected. The principal roads are good; but a great deal yet remains to make them what they should be; but the bridges compare well with the best in the state.

The [town of Mequon, with its village of Thienville, is a thriving little place, and is a better wheat market than Milwaukee. Farming lands lying near it command from \$80 to \$100 per acre.

The town and village of Cedarburg has 1,600 inhabitants; 4 churches, 1 woolen mill, 2 grist mills, 1 saw mill, 3 quarries, and is the present terminus of the Northern Railroad. The woolen manufactory is celebrated for the fine quality of its cloths, and is not able to meet the demand for its goods.

The villages of Hamilton, Grafton, Port Valo, Saukville, Waubesa and Port Washington are all thriving, active, growing places. The latter is situated on Lake Michigan, and is the county seat, and has 1,800 inhabitants. The government is building a harbor with a channel deep enough to admit vessels with seven feet draft. The commerce of this port for the last year was as follows:

Received.—Merchandise, 400 tons; wheat, 35,000 bushels; flour, 7,000 barrels; rye, 50,000 bushels; barley, 60,000 bushels; oats, 50,000 bushels; potatoes, 25,000 bushels; beans, 500 bushels; peas, 3,050 bushels; eggs, 200,000 dozen; butter, 500,000 pounds.

Shipped.—Wheat, 35,000 bushels; flour, 75,000 barrels; rye, 50,000 bushels; barley, 60,000 bushels; oats, 45,000 bushels; potatoes, 24,000 bushels; beans, 500 bushels; peas, 3,050 bushels; eggs, 200,000 dozen; butter, 500,000 pounds; hay, 500 tons; pork barrels, 1,000; shooks, 10,000 packages.

This is only what was shipped by lake, to parts, east, south and north. Shipments of wheat are generally made from this port direct to New York.

PEPIN COUNTY.

[From the Immigration Pamphlet of 1870.]

Pepin lies in the northwestern part of the state, its western border being on the Mississippi at Lake Pepin. There are seven towns. It is well watered by the Chippewa river and its tributaries. Through it, and the Mississippi on the west, it finds an outlet for the products of its industry.

This county contains 20,923 acres of improved land, at an average price per acre of \$10; 78,539 acres of unimproved land, at an average price per acre of \$2.50. There are 2,679 acres of state land in this county.

There are six postoffices; twenty-six school houses; four church buildings; four flouring mills; six saw mills; one woolen factory; two foundry and machine shops, and two other manufacturing establishments. Population of county, 4,659. There are two thriving villages; Durand, with a population of over 700, and Pepin, with about 500 inhabitants.

Its agricultural productions are of the usual variety, and excellent in quality. According to the census of 1870 the amount of wheat raised was 97,905 bushels; rye, 4,774 bushels; corn, 109,485 bushels; oats, 80,118 bushels; barley, 7,409 bushels; wool, 7,950 pounds; potatoes, 26,917 bushels; butter, 127,535 pounds. The total value of its agricultural productions is estimated at \$273,354.

PIERCE COUNTY.

BY J. M. BAILEY, PRESCOTT.

Pierce county is the most western county in the state, lying in the southern portion of the St. Croix valley, immediately south of the fourth parallel of north latitude. It is bounded on the north by St. Croix county, east by Dunn, south by Dunn, Lake Pepin and the Mississippi river, and west by the Mississippi and Lake St. Croix. The general surface of the country is undulating, with no wide stretches of prairie, or high elevations of mountains. There is one peculiar feature in the make of the country not often found; there are interspersed over the prairies and timber portions, elevations or mounds of various sizes and forms, nearly all of the same elevation, from seventy to eighty feet, capped with lime rock. This rock is usually covered with earth from four to six feet in depth, of equal fertility with the valleys. The county is about equally divided into prairie, oak openings and timber. The west and north portion was, in its primitive state, mostly covered with scattering oak; the southern and eastern mostly heavily timbered with the usual varieties found in hard wood districts, with some pine on the rivers. The soil, of the open country is a sandy loam, with magnesian lime stone foundations; of the timbered portion, a vegetable mould with a clay foundation. The superior fertility of the St. Croix valley is now quite generally known. Our soil being productive and easily worked, it is no wonder that the chief business of our people is agriculture. Like most new countries, the first immigration of settlers were a class in moderate means, having a fortune to make; their only capital strong hands and a future prospect of good health. Our population is about equally native Americans and foreigners, the latter largely German and Norwegian. The last census gives us a population of 10,003, having increased nearly 100 per cent. in the last decade. Our county is new, and it has been our misfortune to have selected in our fertile valleys too large a proportion of lands reserved for public uses.

First, the state made large locations of university lands which were appraised too high to induce a settler of limited means to make a purchase when he can go further and find Uncle Sam's generous offer of a "homestead." A large tract was selected by the Fox and Wisconsin River Im-

provement Company, at a very early day. These lands have never been in the market to this day. The railroad companies have another quite large reservation, and have failed as yet to build the roads as a recompense to settlers upon alternate sections.

Our chief business is wheat raising; the soil and climate are peculiarly adapted to the cultivation of this crop. The needs of the early settler require quick returns for his labor, and the production of wheat in this section has been almost certain to answer this required demand.

The average yield per acre has undoubtedly exceeded fifteen bushels for the past ten years. My impression is that the future average will not be lessened, as our farmers are improving their manner of cultivation by manuring, planting, and seeding to grass.

The stock of the county is improving and increasing. All intelligent farmers begin to see the great benefit derived from manuring and planting the more worn fields, after which to seed to grass. To make manures they must increase their stock, and to make the keeping of stock profitable in itself, the improved breeds must be had.

As compared with the country south of the center line of Illinois, this may not be considered a first class corn country. When compared with the country north of that line we do not fear to challenge comparison. In the timber sections the flint varieties are grown. In the open country the dent varieties are chiefly cultivated. A failure of a crop of corn is no more likely to occur here than far south; the yield per acre may average less. Oats and barley are more or less raised by every farmer, as the following census statistics show:

Wheat raised in the county in 1869.....	325,978
Rye.....do.....do.....do.....	2,560
Corn.....do.....do.....do.....	81,638
Oats.....do.....do.....do.....	175,198
Barley.....do.....do.....do.....	<u>25,231</u>

Winter wheat is chiefly grown in the timber sections, and the varieties of spring grain on the open lands.

The soil being dry and porous, it was the conclusion of all early settlers that this could not be a good grass country; but very few made any effort to prove or disprove this impression. When the county became more settled, necessity led the farmer to a better and more systematic manner of farming. Little patches of grass were sown upon manured soil, after a crop of corn; a luxuriant heavy yield astonished the natives. Clover was not tried to any extent until within the past five or six years; year by year it has gained in the confidence of the farmer, and all now agree that this is as good a clover country as can be found. A large amount of seed has been exported from the county within the past two years.

Fruits.—A few early settlers made the attempt to cultivate the apple with indifferent success. More recently with a better knowledge of the climate many have succeeded with the hardy varieties, and now have small orchards

which have fruited excellently. All of the crabs produce abundantly. The strawberry, raspberry and plum are at home here; wild plums of several varieties are found all over the county. A few are engaged in the cultivation of the grape.

Aside from the manufacture of flour and lumber, we do but little. The county is well watered and divided by seven rapid flowing rivers running the whole length of the county, and all emptying into the lakes and rivers within our western boundary except one, the Eau Galleu. All of these rivers have good mill sites at short intervals, their whole length. The aggregate length of these rivers within the county, is one hundred and fifty miles, beside the navigable streams. There are also numerous brooks and creeks which discharge into the rivers, some of which have sufficient fall for mill sites.

There are in the county twenty-six saw mills, the greater number of which are employed in cutting hard wood lumber. Also several stave, furniture, blind and sash factories, which furnish Minnesota largely with their productions. The flouring mills of the county have an aggregate of thirty-three run of stone. A large quantity of flour is sent to eastern markets.

Much interest is manifested in the opening and working of public highways. In school and church accommodations the county is not behind her neighbors. Each town is well divided into school districts, and many have erected neat and commodious school houses. We have no railroads constructed within our bounds at the present writing, but the towns on the Mississippi can easily reach the roads of Minnesota. Our western and southern boundary, as before stated, being the St. Croix Lake and Mississippi river and Lake Pepin, gives us a water front of fifty-seven miles. During the season, steamboats from Pittsburg and all intermediate points, are almost hourly arriving at Prescott, the chief town in the county. At this place steamboats that run the St. Croix for sixty miles above, make connection with the Mississippi boats. The facilities for shipping all of our surplus products, as can be seen, are not often surpassed in a new country, or indeed in sections long settled.

POLK COUNTY.

BY SAMUEL S. FIFIELD, OSCEOLA MILLS.

This county may properly be termed the northern agricultural county of the state, for its soil is of the best, producing crops that cannot be excelled; spring wheat yields from ten to forty bushels to the acre, oats from forty to eighty; corn from fifty to one hundred, and vegetables as good as can be produced on this continent.

The county contains upwards of 100,000 acres of improved land, which is being rapidly increased every year. The population is about 5,000, its area 700,000 acres, part of which is rich prairie. The greater portion is heavily timbered with hard wood. The northern and eastern townships of the county contain vast quantities of valuable pine timber, and the lumber business is one of the chief features. The county is watered by numerous rivers, brooks and clear spring lakes, abounding with brook trout, and other fine fish. Wild meadows are numerous, producing excellent hay, and grazing for cattle, sheep and horses, which thrive and do well.

Land is cheap and can be obtained for actual settlement upon easy terms. There is considerable government land for homesteads left, but it is being rapidly taken up.

The St. Croix river, a navigable tributary of the Mississippi, bounds the county on the west, affording a means of transportation for the products of the county, connecting with the West Wisconsin Railroad at Hudson, thirty miles south of Osceola the county seat, and with the St. Paul, Stillwater and Taylor's Falls Railroad, and the Superior and Mississippi Railroad at Stillwater, Minnesota, 23 miles north of Osceola.

There are thirteen postoffices, thirty-three school houses, five churches, eleven stores, six saw mills, three flouring mills, and a number of manufacturing establishments in the county.

There are ten organized towns, all in good financial condition, with a population of prosperous, industrious and intelligent people, the majority of whom come from the New England states, and believe in good schools and good morals.

Water powers abound; that afforded by the Falls of St. Croix being one of the largest and best in the west. Osceola and St. Croix Falls are the chief villages. Good wagon roads run through the county in all directions, which are being constantly improved as the settlements prosper; and in a few years the county will be thickly populated, and under improvements.

No section of the state affords better inducements for capitalists and home-seekers, and the fact that emigrants are fast coming in, proves conclusively that the county is well adapted to agricultural pursuits.

Railroads are wanted to develop northwestern Wisconsin, especially Polk county, and as valuable grants of lands are expected—in fact guaranteed by the general government—a few years will see this great want supplied.

PORTAGE COUNTY.

BY J. PHILLIPS OF STEVENS POINT.

This is the most central county of the state, and although its resources are far from being fully developed, it already holds the first rank on the upper Wisconsin in regard to position, soil, climate and commercial advan-

tages. It is thirty miles in length, north and south, and about twenty in width. The southern and eastern portions of the county contain a majority of the inhabitants, the northwestern part being composed mostly of heavy timbered lands. The number of townships in the county is twenty-two.

Our agricultural resources, while they cannot, for obvious reasons, compare favorably with those of the older and more thickly settled portions of the state, are nevertheless far in advance of the estimate formerly placed upon them. There is very little waste land in the county—the few swamps and marshes which it contains being susceptible of drainage, whereby they may be made equal or superior to the best farming land in this vicinity. The soil in some portions of the county is a light sandy loam, yet it is quite productive in favorable seasons, and under judicious management will doubtless be susceptible of great improvement. In the eastern portion of the county the soil is probably as good for farming purposes as any in the northern portion of the state.

The number of acres at present under cultivation in the county is 61,079. Amount of wheat raised during the year ending June 1, 1870, 210,139 bushels; rye, 59,309 bushels; corn, 64,022 bushels; oats, 152,143 bushels; barley, 6,137 bushels; potatoes, 113,976 bushels. Amount of wool produced during the same year, 25,987 pounds; butter, 199,517 pounds; cheese, 7,693 pounds; hay, 9,652 tons; hops, 70,074 pounds.

The total estimated value of all farm productions for the same year is \$643,757; the value of manufactures (chiefly lumber) produced, \$522,742.

Owing to an idea which has prevailed very extensively, that our sandy soil and long winters would prove an insuperable obstacle to the raising of fruit, very little effort has been made until quite recently, in that direction. It has now, however, been proved beyond a doubt, that many of the hardier varieties of fruit can be as successfully raised here as in any portion of the state. At the last county fair fifteen varieties of apples, all excellent, and of fair size were exhibited, from the farm of Hon. George Cate, in the town of Amherst. The flourishing orchard and nurseries of Mr. Frank Felch, in the town of Stockton, also affords abundant evidence of the possibility of fruit-raising in Portage county. A large number of trees have been set out by our citizens, and a few years will doubtless witness a vast increase in the amount of fruit raised in this vicinity.

We have a sufficiency of good stone for building purposes. The white and grey sand-stone, of which the court house now nearly completed at Stevens point, is composed, affords a fine illustration of our resources in the way of building material.

The manufactures of the county are thus far confined to the single article of lumber, of which a great amount is annually produced. The number of saw mills in the county is about twenty-five, many of which are steam mills of large capacity, employing a great number of workmen.

The internal improvements of the county are creditable in their character;

a fine bridge has been built across the Wisconsin at Stevens Point, at a cost of over twenty-two thousand dollars. We have from 15 to 20 church buildings in the county, and capacious and convenient school edifices in nearly all our towns. The court house at Stevens Point is a fine stone building, now nearly completed, at an expense of thirty thousand dollars; its elegant architecture and proportions would not do discredit to any of our large cities. No railroads at present traverse any portion of the county, although there are two or three in process of construction, whose advent is confidently expected within a year or two at farthest.

With railroad facilities at our command, a new era of prosperity will doubtless dawn upon our county, and a few years to come will see her holding a prominent rank among the foremost counties of the state.

RACINE COUNTY.

BY HON. W. C. ALLEN, RACINE.

Racine county is bounded on the east by lake Michigan, on the south by Kenosha county, on the west by Walworth and on the north by Milwaukee county. The climate may be considered as good as in any county in this country, in the same latitude, and in some respects superior. The waters of lake Michigan, exert a salubrious and healthy influence on the atmosphere in dissipating all poisonous vapors that might be in the air inducing fevers and other sickness. In the summer season there is always a sea breeze from the lake during the night, and a land breeze during the day, thereby changing the atmosphere almost continually.

The topography of the county is that of an undulating character, rising to two hundred and sixty feet or more above the waters of lake Michigan. The county has only one considerable river,—the Fox—which runs through the whole breadth of the county from north to south, affording excellent water power in the flourishing villages of Waterford, Rochester and Burlington. Root river which empties into the harbor at Racine, affords considerable water power. The soil of Racine county is generally of an argillaceous loam, rich and deep. The county is abundantly supplied with stock water. The subsoil of the county is marl clay, generally free from gravel or sand. All kinds of timber grow in abundance in the county, common to the state, except the coniferous class. The soil of the county is well adapted to the raising of wheat, rye, barley, oats, corn, potatoes, turnips and carrots; but, in our judgment, there is no county in the state better adapted to the raising of grass, and stock-breeding. From the peculiar character of the soil, and the moist atmosphere prevailing during the spring, summer and autumn months, induced by the constant vapors from lake Michigan, an abundant, sweet and nutritious grass is produced.

Experienced stock-growers have discovered this fact, and availed themselves of its advantage, and started herds of superior blood. Among the most prominent of the stock-breeders, are George Murray, Esq., Richard Richards and Henry S. Durand.

The fauna of the county does not materially differ from other counties of the state. The assessed valuation of the county of Racine is 6,178 horses valued at \$352,298; 15,401 head of neat cattle, valued at \$213,033; 61 mules and asses, valued at \$4,380; 36,008 sheep, valued at \$55,883; 6,112 swine, valued at \$24,268; 3,211 carriages, wagons and sleighs, valued at \$90,588; 288 pianos and melodeons, valued at \$32,140; \$200,000 bank stock, valued at \$240,000; merchants and manufacturers' stock, \$760,891; personal property, \$632,682; 207,410 acres of land assessed, valued at \$4,698,133; city and village lots assessed, \$2,560,411. Population 26,742. Has 83,163 acres of improved land; 166,676 bushels of wheat; 3,570 bushels of rye; 145,816 bushels of corn; 232,749 bushels of oats; 17,426 bushels of barley; 81,566 pounds of wool; 94,868 bushels of potatoes; 358,878 pounds butter; 625 pounds cheese; 26,383 tons hay; 9,300 pounds hops. Estimated value of farm products, \$1,000,000. Estimated manufactured products, \$3,174,825. Public debt, \$300,090. Paupers, 25, supported at a cost of \$5,000.

The stone and lime business is largely on the increase at the city of Racine. A little outside of the city limits are inexhaustible stone quarries, out of which is burned the very best quality of lime. The lime-stone belongs to the Niagara group, and is of excellent quality for cellar walls, and for the basements of all kinds of buildings. The stone and lime find a ready market, and the demand is largely on the increase.

The city of Racine is situated on lake Michigan; has a large and commodious harbor, and one of the finest elevators in the state. The city stands about 40 feet above the lake, and contains a population of 12,000, and is justly called the "Belle City;" has fine railroad, steamboat and sail vessel connections with all parts of the country; stands out in the lake about four miles, on a promontory; winds from the northeast and west blow over it, making the city one of the most delightful places to live in in the west, and no finer summer resort can be found. The soil about and near the city is well adapted, as well as the climate, to the growing of apples, pears, plums, cherries, grapes and all small fruits.

It has fine public school houses erected at a cost of over \$75,000; a college with over 200 pupils and eight professors, and buildings and grounds valued at \$287,000; twenty-two churches, some of which cost large sums of money; and an orphan asylum built by the munificence of Isaac Taylor, deceased, at an expense of \$75,000. The city prides herself on her large and valuable manufactures. Among the most prominent of which we mention J. I. Case & Co., who employed 280 hands, and manufactured 1300 threshing machines in 1870; the Geiser Threshing Machine Co. employed 100 hands and turned out 300 machines; Mitchell & Co., who manufactured

4,000 lumber wagons in 1870, and employ 165 hands; Fish Brothers in the same line, employ 125 hands, also made 4000 wagons in 1870; L. S. Blake & Co.'s woolen factory, engaged largely in the manufacture of shawls, flannels and lady's cloth; A. P. Dickey, manufacturer of fanning mills and other agricultural implements, employs 50 men; Elliot & Wetherell, manufacturers of baskets, employ 180 hands, making \$100,000 worth of baskets per year. Besides those mentioned above, there are a large number of factories doing a large business, and adding much to the prosperity of the city, but space will not permit to mention them in detail.

The city is 25 miles south of Milwaukee, 62 miles north of Chicago, and commands a large local trade from the surrounding country. Her industrial pursuits are all on a solid foundation. Not a single failure has occurred among her business men the past year, and at this time may be regarded one of the most prosperous cities in the west, in proportion to her population. Her public debt arranged and being funded in new bonds at a sum of less than \$300,000, running ten and twenty years, she anticipates for herself a brilliant future. Large wealth has already been acquired by many of her citizens, and is increasing year by year. Her harbor admits with ease and safety the largest vessels which float on the lakes, and commands as favorable position for trade and commerce as any on the lake.

RICHLAND COUNTY.

BY J. WALWORTH, RICHLAND CENTER.

Richland county contains sixteen townships of land, government survey. The first permanent settlements were made here in 1848, and the county seat was located at Richland Center in 1851. The population of the county at that time was about 1,000. The census of 1870 gives us a population of 15,736, a gain of 6,004 within the last ten years.

Our agricultural products are very encouraging to those engaged in farming. Winter wheat uniformly yields well and is of an excellent quality, and is regarded as a surer crop than the spring. Corn, buckwheat and potatoes all do well, and appear to be the natural products of the valleys. The grasses flourish on nearly all of our lands, but the timbered lands especially are peculiarly adapted to the production of clover and timothy. Nearly three-fourths of the county is heavily timbered with black and white walnut, the several kinds of oak, and hard or sugar maple. From these, in favorable seasons, a large quantity of excellent sugar is made. The soil of the timbered land is a rich, dark, sandy loam, easy of cultivation, producing a rapid growth of vegetation. The adaptation of the soil to the production of grasses has induced considerable investment in stock raising, and much care has been taken to improve the breeds of horses, cattle,

sheep and swine. Stock-raising is much more profitable than the cultivation of grain, on account of better market facilities, and requiring less labor, it yields larger profits. Several cheese factories have been in successful operation for the last two or three years, and so far have proved profitable investments.

Iron is found in several localities in the county in large deposits, easily accessible; but the want of transportation has deterred investments in that branch of business. A vein of lead has recently been discovered in the southern part of the county, which is now being worked with fair profits. There are also indications of lead and copper which have not as yet been sufficiently opened to demonstrate their extent.

Our stone quarries are excellent, but have been little used except to supply the home demand. The gray sand stone, which is frequently found cropping out of the bluffs is the most common. In many of the ridges limestone is found in layers of suitable thickness for building purposes. In addition to the more common kinds of stone there has recently been discovered a species of white marble, which is susceptible of a fine polish and is believed to be valuable for most purposes for which the eastern marble is now used.

Quarrying and mining have heretofore received but little attention for want of means, as well as for want of scientific researches, but we have reason to believe that when proper investigations have been made, they will reveal rich deposits of mineral and building stone, which will induce adequate investment for their successful developement.

The water power of the county is abundant, though but partially improved. We have flouring mills, saw mills and other machinery sufficient for the wants of the county. The Little Baraboo, and Willow creek, Pine river, Mill creek, Knapp's creek and Kickapoo river, with others of smaller dimensions, all afford excellent power for machinery which can be used as the development of the county requires.

Manufacturing in this county is comparatively in its infancy, only being established as the local demands require. At Richland Center are two furniture establishments, doing a good business in general furniture, and wagon, plow and other timbers. The proximity of a large body of timber for manufacturing purposes renders this a convenient and desirable point for such establishments, and the demand can hardly exceed the facilities of supply for many year to come.

Our products are now loaded upon boats at the factories, and descend the Pine river to the Wisconsin, thence down that river to the Mississippi. This is found a much cheaper mode of transportation than by rail, costing less than half of the railroad tariff. We very sensibly feel the need of a water communication to give us a less expensive transportation for all of our products, and are looking with deep solicitude for the long contemplated improvement of the Fox and Wisconsin rivers, as the only sure means of

relief to us from the present onerous and extravagant railroad tariff which so reduces the profits of our several branches of industry.

The public improvements of this county, in roads and bridges, are rather limited, having but a few miles of the Milwaukee and St. Paul railroad running through the southwestern part, along the Wisconsin river. Efforts are being made to secure the construction of other lines of road, which we hope will be attended with success.

Our public improvements, state and county roads, etc., are proportioned to the general development of the country. Our county buildings are mostly convenient, and adequate to the present wants for official and judicial purposes. The educational interests of the county are regarded as in a successful and prosperous condition. We have many good and convenient school edifices in the several villages; and the country districts are generally well supplied with comfortable school houses.

The principal farm products exported from this county are wheat, pork, beef, butter, wool and poultry, which have largely increased within the last five years. This county being so well adapted to stock growing, the attention of the farming community is becoming largely directed to that kind of husbandry, as there is found to be less risk from unfavorable seasons or variations of markets, and it will eventually be the leading occupation of the farmer in this section. The wool growing interest has not yet received that attention which its magnitude evidently warrants, owing partly to the exposure of sheep to wild animals, and partly to the want of experience in the business, but it is evident that in a few years this county will be largely engaged in this safe and profitable business.

Fruit culture has attracted considerable attention for several years, and the success justifies the hope that with experience, and proper care in the selection of those varieties adapted to our soil and climate, that fruit can be grown here to supply our home necessities. There is a horticultural society in this county of about three years standing. To Mr. A. L. Hatch, the secretary, I am indebted for the substance of the following remarks upon this subject:

The diversified surface of the country gives nearly all desirable features of slope and soil; the hills with timber, furnish protection from winds, so that good orchard sites may be found on a large share of the farms. In the south-east part of the county there is a stretch of sand prairie, and a smaller one in the southwest part, bordering on the Wisconsin river, that present no very inviting features to fruit-growers, except for the production of strawberries and melons, which produce largely on such soils. Within the limits of Richland are some of the finest ridge lands in the state, elevated from 200 to 250 feet above the valleys, mostly heavily timbered. Native plums and blackberries abound in great variety. Raspberries, especially are plenty; cherries and crab apples are natural to the valleys, and are found in abundance.

Our first efforts in fruit-raising were unfortunate, from selecting unsuitable sites, most of which were of the rich, moist, valley land; also, from attempting to cultivate the tender varieties of those grown in warmer climates. That we can grow fruit here is no longer a problem, and what kind to plant, and how to cultivate, are now the questions to be solved. The ridge lands are found to be far superior for apples and grapes to the valleys. The snow falls deeper on the hills, remains longer, and the frosts are not so late in spring. The ridge lands are particularly productive in the plum, and pears are grown with success. The richer, moist soil of the valleys are well adapted to the growth of currants and other small fruits. On all soils throughout the county, and on all sites, the Siberian apples are proving perfectly hardy. The improved sorts are fast gaining a superiority over the smaller and more astringent kinds.

From numerous experiments it has been ascertained that the following varieties of apples are the hardiest and best adapted to our soil and climate, viz.: Duchess of Oldenburg, Gros Pomere, English Golden Russett, Fameuse, Red Romanite, Sweet Pear and Alexander.

Of plums, no variety has yet succeeded well in the valleys, but on the high lands the Washington, Green Gage and Peach plum have done well.

Of grapes, the Concord is the best, but at four years of age, the Delaware is preferable; the Clinton is found to be hardy and productive, the Rogers' Hybrids seem more promising than any other, though the Northern Muscadine is much valued by those best acquainted with it.

The wild grape of which there are several varieties growing spontaneously upon the hill sides, are of an excellent quality, which furnish the pioneer a rich and delicate dessert.

Strawberries have proved an excellent fruit, the different kinds have been cultivated with success and profit; the best are the Green Prolific, for light soil, and the Wilson for rich soil.

Raspberries and currants seldom fail, and uniformly produce well with comparatively little care, more than to plant and protect them.

From the successful efforts already made it is evident a great variety of fruits can be cultivated in this section of the country with profit.

ROCK COUNTY.

BY HON. ALEXANDER GRAHAM, JANESVILLE.

This is one of the oldest counties in the state, the first settlement being made in 1835, and in 1839 the county was organized, the seat of justice being established at Janesville. It now contains a population of about forty thousand.

It comprises one of the best agricultural districts in the northwest. Its soil, climate and commercial situation are equal to any other in the west, and there is scarcely an acre of land within its limits which cannot be used for agricultural purposes. In the brief space of thirty-five years the entire county has been opened up to cultivation, and over its entire surface may be found homes of comfort and beauty.

The farms in this county range in value from ten to one hundred dollars per acre, and are sought for, not so much by emigrants seeking cheap lands as by those desiring beautiful homes where they may at once enjoy all the comforts and conveniences to be found in the older and more wealthy portions of the country.

Rock county is better adapted to the growing of grain than of grass, and every year marks a decided progress in the mode of tillage and the consequent increased quantity of production. The wicked and ruinous practice, of many farmers, of burning the straw and manures, instead of returning them to the soil in compensation for its rich harvests, has been abandoned. Wheat is the great staple of production, it being estimated that in a single crop the production of the county was not less than three millions of bushels.

Corn, barley, oats and all the coarser grains grow in rich abundance, amply rewarding the husbandman for his toil.

Notwithstanding Rock county is better adapted to grain growing than stock raising, our farmers are giving considerable attention to the breeding of stock, and acting upon the correct idea that it costs no more to raise a blooded animal than a "dunghill," are constantly introducing the best varieties, and at the county fairs may be seen horses, cattle, sheep and swine, animals as noble as almost any other section of the country can exhibit.

The surface of Rock county is undulating and is drained by the Rock and Sugar rivers, with their tributaries, nearly all of which are of sufficient size to furnish water power for manufacturing purposes, and are more or less improved. Rock, one of the most beautiful rivers, as well as one of the very best mill streams in the west is already used largely for manufacturing purposes, and every year is attracting more and more the attention of men of enterprise and capital; when fully improved its power for the propulsion of machinery is almost exhaustless. The facilities for manufacturing in Rock county by water power are but partially improved, and yet she ranks among the first in the west, her annual manufactured product being worth not less than three millions of dollars, consisting principally of flour, agricultural implements, paper, woolen fabrics, cabinet ware, lager beer, etc.

During the last decade the general business of the county has greatly increased, and everywhere may be seen tokens of prosperity and growth, based upon the production of diversified labor in agriculture and manufactures. During the same period the public buildings erected in the infancy

of the county have given way to permanent and beautiful structures, and the county now boasts of a splendid court house, costing over one hundred thousand dollars, and churches of all denominations, equal in size, style and convenience to those of almost any county in the eastern or middle states; and the citizens of Jandsville and Beloit each support a new and creditable opera house.

Rock county is pierced east and west, north and south, by the Milwaukee and St. Paul, and the Northwestern railways.

The educational interests of the county have not been neglected. Under our system of free graded schools, upon the New England plan, valuable results have been attained, and it is gratifying to observe a steadily increasing interest in the schools, and a proper appreciation of them by the people generally. The cities of Janesville and Beloit have each expended large sums in the erection of school buildings, and the sum invested for school purposes cannot be less than two hundred thousand dollars. Superadd to this Beloit College, under the patronage of the Congregationalists, one of the best managed and most flourishing institutions of learning in the west; Milton College, under the management of the Seven Day Baptists, and the Evansville Seminary, under the control of the Freewill Baptists, and you place within the reach of every child in the county the means of a liberal education.

The Young Mens' Literary Association of the city of Janesville, have collected within the last four years a very creditable library of about four thousand volumes of well selected works, which form a nucleus for ultimately placing within the reach of the reading public a valuable means of culture.

Rock county contains two of the finest cities in the state of Wisconsin—Janesville and Beloit; the former containing a population of about ten thousand, the latter five thousand, besides numerous villages.

In matters pertaining to horticulture, the inhabitants of this county are not behind those of the other counties of this state. Considerable progress has been made in the past few years in these pursuits, and an improved taste is being manifested by the people generally in beautifying and adorning their homesteads by the liberal planting of fruit and ornamental trees, vines and shrubs. Time and experience have demonstrated that with care and attention certain varieties of apples as well as pears and plums can be successfully and profitably grown. The time has arrived when many of our "country seats" take pride and pleasure in fine grounds, and tasteful gardens; and in the cities, nearly every house has its garden spot, tastefully arranged with choice flowers, vines and evergreens, and kept in the neatest order. In addition to the flower garden, many have conservatories stocked with choice winter flowering plants; while others with less conveniencies keep them in the parlor, and the effect is a wide diffusion of a taste for flowers and a corresponding taste and order

throughout the whole household, making home more pleasant and attractive.

SAINT CROIX COUNTY.

BY DR. OTIS HOYT, HUDSON.

This county contains 454,400 acres of land. It is watered on the west by the Saint Croix river; from the northeast corner, running west to the Saint Croix, is Apple river, and about ten or twelve miles south is Willow river, running from the east to the west side and emptying itself into the Saint Croix at Hudson. On the east side of the county is the Eau Galle river, running from the north to the south side of the county, through its whole extent. From near the center of the county rise the Kinnickinnick and Rush rivers, then running in a southwesterly direction through Pierce county, the former discharging into the Saint Croix, and the latter into Lake Pepin. All of these streams furnish numerous good water facilities for manufacturing purposes.

Our industrial interests are somewhat varied, agriculture being the most important, for which our soil is second to no other county in this state. Of the 454,000 acres of land 101,000 are under cultivation, or less than one-quarter of the whole. Wheat is the principal crop, which yields a fair remuneration for the labor to secure it, although some other crops are cultivated such as oats, barley, corn, potatoes, etc.

For the year 1870 there was produced, 903,572 bushels of wheat; 68,700 bushels of barley; 414,000 bushels of oats; 59,000 bushels of corn; 62,000 bushels of potatoes; 1,000 head of beef cattle; 1,300 fat hogs; 7,253 tons of cultivated hay; 9,400 pounds of hops; which we flatter ourselves is doing quite satisfactorily with a population of less than 12,000 people.

In fruit culture we are doing something, and are succeeding very well with some kinds of the apple, such as Duchess of Oldenburg, and what is called the Russian crab—which is the New England Early Harvest apple, with another outlandish name—and some of the hardy winter apples. Currants, gooseberries, strawberries, raspberries and other small fruits, are a sure crop. In the culture of grapes little has been attempted; but we find the more hardy varieties do well with judicious care. The Concord, Hartford Prolific, Clinton, Ives Seedling and Delaware do finely.

In breeding of cattle some of our farmers are fast improving their herds by crossing the natives, or what we call scrubs, with the Durhams and Devons. In horses we are doing something with the Black Hawk, Morgans and Brignolias. Sheep husbandry has not proved remunerative, probably because we started with the small Merinos. The Southdowns, Leicestershires and Cotswolds do finely. Pork production is steadily on the increase. A cross of the White Chester and Suffolk makes excellent hogs.

Manufactures are confined principally to lumber, flour, farming implements, tin and sheet iron ware, wagons, etc. We have eight mill propelled by steam and four propelled by water for manufacturing lumber, producing eighteen million feet, valued at the mills at \$216,000; and eight flouring mills propelled by water, producing 30,000 barrels of flour annually. Two plow factories, producing \$20,000 value of plows annually; three wagon factories, one furniture factory and one iron foundry. The iron and steel used in manufacturing agricultural implement and wagons, is procured mostly from Pittsburg, Pa., the wood from our own locality. There is annually cut within the county limits, about 20,000,000 feet of pine logs, valued when cut at five dollars per thousand, or \$100,000; most of which is worked up into lumber here.

There are ten church edifices in the county, valued at \$57,500; a court house and jail worth \$35,000; fifty-one school houses, built at a cost of \$47,000. For roads and bridges we expend about \$16,000 a year.

The amount of general merchandise sold in the county per annum is about \$755,000; of agricultural implements, \$50,000 worth.

During the year 1870 there were 540 steamboat arrivals and departures, on which were shipped 714,000 bushels of wheat, 68,700 of barley, 5,000 of oats, 24,740 barrels of flour and 9,400 pounds of hops.

The West Wisconsin Railway, now in process of construction, and to be completed to Hudson during 1871, runs across the county nearly in an east and west line, near the centre of the county, which will give us direct connection with Madison, Milwaukee, Chicago and the east, saving a distance of nearly ninety miles over the Minnesota railways, making us an excellent outlet for our products.

SAUK COUNTY.

BY JOSEPH W. WOOD, BARABOO.

A glance at the map will exhibit the central position of Sauk county and indicate the striking features in relation to its water-shed and drainage. It occupies the great bend of the Wisconsin river, which, refused a direct passage to the Mississippi by the miniature mountain range known as the Baraboo bluffs, makes its grand sweep to the eastward and rounding their eastern extremity turns an acute angle and endeavors by directness thereafter to make up for its previous loiterings.

For sixty miles, or more, the Wisconsin forms a boundary line for Sauk county, and its citizens are deeply interested in the national scheme for improving its channel so as to make it a section of the national highway connecting the lakes with the Mississippi. It is expected that not many years will elapse before its products shipped at our wharves can pass by either

the great lakes or the Mississippi, to the remotest markets of the earth without reshipment.

The Baraboo bluffs form the backbone of the county—the northern slopes of which are drained by the Baraboo river; the southern slopes give rise to numerous tributaries of the Wisconsin. There are no marshes or lakes of any great extent in the county, its central elevation being sufficient to secure thorough drainage, and no considerable stream can be found within its limits which does not flow with sufficient rapidity to furnish numerous water powers along its course.

The northern border of the county rests upon the Potsdam sandstone of the lower silesian, which dipping to the south, in the central part, commences passing under the lower magnesian limestone. The western limit of the drift formation passes in a line from northeast to southwest through the county. This gives a great variety of soil and surface adapted to a wide range of agricultural products.

In the vicinity of Devil's lake we find evidence of a vast upheaving power which has broken up the strata of the Potsdam sandstone, highly vitrified in that locality, forming deep anti-clinal valleys.

While the soil of the county is comparatively free from detached rocks which hinder cultivation, except in some parts of the bluffs, yet good quarry stone is found in almost every neighborhood. Lime of an excellent quality for concrete is burned in the central and southern portions of the county.

The only mineral known to exist at present in quantities sufficient to be profitably worked is iron. That is found in different localities in the county, but it is only worked at present in the town of Ironton. The workings at that place are surface workings, situated on a side hill, and have been pushed until a breast of twenty feet is obtained, and no bottom has been reached. The supply seems to be inexhaustible. It is brown hematite, and yields about seventy-five per cent. from the furnace.

Last year 1,300 tons of iron were manufactured, and the present furnace has a capacity for 2,000 tons annually. Competent judges pronounce it equal to Lake Superior iron. It lies in the midst of a rich agricultural region, heavily timbered, and a profitable market is opened for the wood as it is cleared from the land. The iron finds its market in Wisconsin, Minnesota, Iowa and Illinois, in the order named.

Good clay for brick is found wherever it is needed; near Baraboo a cream colored brick is made equal in quality to the celebrated Milwaukee brick.

Probably the most romantic scenery in the state of Wisconsin is found within this county; Devil's lake is surrounded by rocky cliffs, five hundred feet in height; the Dells, the upper and lower narrows, and the Baraboo bluffs, are renowned for their scenery, and are yearly the resort of many thousands of visitors.

The county is heavily timbered especially on the southern side of Bara-

boo river, with all the species common to this latitude; varieties of oak, sugar maple, soft maple, ash, basswood, white elm, hickory and butternut. Our timbered surface delayed the early development of our agricultural resources, but the exceeding richness of the soil, and its natural adaptation to clover and the grasses when once subdued, amply pay for the extra labor of opening the farms.

The Baraboo river and its tributaries flow with sufficient rapidity to furnish a number of good water powers; probably there are not fewer than thirty within the limits of the county. The great water-power of the county is found at Baraboo, the county seat, where the river falls forty feet in running about two miles. It is improved by four dams. At the upper dam there is a saw mill and manufactory for wagon work; at the second is located the Manufacturing Company's works and the Island Mills Woolen Factory; at the third is a saw mill, foundry and machine shop, also a large flouring mill, at the fourth is located the Manchester Woolen Factory. Of the whole power available at Baraboo, it is estimated that not more than one-half is at present used.

The principal manufacturing, beyond the local wants of the different communities, is done at Baraboo. The annual capacity of the different works here, may be briefly stated as amounting to the wood work for 20,000 wagons, employing a large force of hands. The Island Woolen Mills, which consume 100,000 pounds of wool, and turn out 90,000 yards of cloth, flannels and blankets; employing 35 hands. The Manchester Mills, using 45,000 pounds of wool, and employing 14 hands. The furniture works of the Manufacturing Company employ from 60 to 75 hands, and turn out about 60,000 chairs and 15,000 bedsteads annually.

The problem of producing our own sugar is engaging the attention of some of our enterprising citizens, and a beet sugar manufactory has just been started, the results of which will be watched with deep interest.

The county is cut on the northern border by the Milwaukee and La Crosse road, and on the southern by the Milwaukee and Prairie du Chien road. Work is now vigorously pushed on a new line of road which will form the connecting link between Madison and the great Northern Pacific Railway.

The county contains about 440,000 acres of land, of which 137,082 acres are improved. The total population is 23,868. The gain in ten years has been 4,905.

Wheat, 487,001 bushels; rye, 24,374; corn, 419,752; oats, 499,576; barley, 22,443; wool, 59,994 pounds; potatoes, 209,699 bushels; butter, 506,171 pounds; cheese, 14,299 pounds; hay, 29,784 tons; hops, 1,274,563 pounds. Annual value of productions and improvements, \$1,838,277. Number of companies or individuals engaged in manufacturing, 122; hands employed, 408. Value of manufactures, \$779,025. These figures compare favorably with the reports of other counties, and show a greater yield in proportion to

the amount cultivated than some of the older counties in the southern portion of the state.

Our agriculture is in keeping with that which generally prevails in new countries. The first settlers have many difficulties to overcome, and are driven by their necessities to make the most they can out of the virgin soil which they till. All the processes are wasteful, and look no farther ahead than the coming harvest. The great laws of compensation are neglected, and in a few years the soil is impoverished to such an extent as to demand systematic labor, if farming continues to be profitable.

We have just reached that point where farmers begin to see that exhaustive farming must give place to intelligent system, if they succeed in making the profits of their lands cover the ever widening circle of their wants. Still our methods are crude; experiments are wanted to adapt farming to the peculiarities of our soil and climate.

It is doubtful whether a crop of green clover has ever been turned under in our county; if it has, the instances are few and the results are not generally known; neither is it probable that plaster has ever been applied to the soil, or that lime has been tried, or ashes, only to get rid of them. Our farmers have escaped all imposition in the matter of guano, superphosphates, etc., and are generally annoyed at the accumulation of barnyard manure. Still the day begins to dawn and many questions of interest to farmers begin to be discussed.

Enterprise has been manifested in procuring improved breeds of stock. The common stock of hogs has been greatly improved and full-blood Suffolks and Chester-whites are found in almost every neighborhood. Our county has been fortunate in being the location of a herd of full-blood Short Horns, and some improvement is manifest, but yet, the greater share of the benefit has passed beyond our borders. The American Merino sheep is common among us, and full-blood Cotswolds are also bred in the county.

We can justly claim some pre-eminence for our county in fruit growing; our nurserymen have been behind none in intelligent experimenting, and we have a list of hardy fruits upon which we can rely with certain confidence. We have generally borne away the prizes from our state fairs and there is no doubt but that our hills and timbered lands are the best adapted to fruit of any portion of our state. The following is the approved list of five hardy varieties of apples; Duchess of Oldenburg, Drap D'Or, Autumn Strawberry, Fameuse, English Golden Russet, and Talman Sweet.

Our great abundance of good grass land, well watered surface would suggest an adaptation to the dairy business, and there is a growing interest in that direction. There are three cheese factories established, and the business is attracting its full share of public attention.

We have a rich soil, an abundance of good water, a healthy climate, plenty of choice timber, inexhaustible beds of iron ore, stone, lime,

and good clay for brick; the pine lumber from the upper Wisconsin, on its way to southern markets, floats for sixty miles along our border, making building material cheap and easy to be had; we have a population representing all the nationalities of western Europe—thrift prevailing among them all; but we need capital to improve our water powers, and work up our timber into desirable forms; we want skilled labor, more furnaces and rolling mills to work up our ore; we want intelligent farmers who will “use the earth as not abusing it,” who will increase instead of exhausting its fertility, so that there may be hope for the coming generations.

SHAWANO COUNTY:

BY D. H. PULCIFER, SHAWANO.

This county is located in the northeastern portion of the state, and comprises valuable timber and farming lands, is crossed by several large rivers and streams, and contains a territory of about 1,000 square miles.

Wolf river is a large and steady stream, suitable for navigation as far as the village of Shawano, while above the village its falls furnish abundant water power for mills, manufacturing, etc. The Embarrass and Red rivers, emptying into the Wolf, furnish excellent mill sites, and help to make available the large bodies of pine timber that are located near their banks. Shawano lake is a handsome body of water about ten miles long and five wide, and has connection, by means of inlets, with several other small lakes above it, and by an outlet with Wolf river, through which large amounts of valuable timber are run to market.

About 1869 the county began to attract the attention of agriculturists, and since that time has made rapid progress in that direction. It has now about 25,000 acres of improved lands, which produce good crops of wheat, oats, corn, potatoes, barley, rye, grass, and all the various root crops. Hops and broom corn grow large and yield abundantly. Considerable attention is being paid to the cultivation of fruit, and, so far, with good success. Apples grow well, and prove well adapted to the soil and climate; the trees look thrifty and healthy. Cherries and plums grow well and yield largely. Berries of the various varieties grow wild in large quantities, and continue through the season, one variety following another; strawberries first, then red and black raspberries, followed by blueberries and whortleberries, which give place to the palatable and healthy blackberry, and the season ends with cranberries.

Attention is being paid to the raising of good stock, and already several fine animals have been brought into the county for breeding purposes. The climate is unusually healthy for sheep; the pasture lands are extensive and cheap, and produce a variety of gasses, herbs and shrubbery, part of

which remains green and nutritious until snow falls. The steady, uniform temperature of our climate must make sheep and wool raising profitable, as the sheep are not so liable to disease, and the yield of wool is greater than in the more southern portion of the state. Pork is cheaply and easily raised, and brings a higher price here than in other places, as it is the staple food of the lumbermen.

Lumbering is the principal business of the county, and until within the last three years controlled every other branch of industry,—since that time agriculture has divided the interest with lumbering. There are large bodies of valuable pine lands in the county, and the winter season is spent in cutting and getting logs into the various streams. As soon as spring opens the “river drivers” drive these logs down the various streams to the markets, where they bring from eight to twelve dollars per thousand feet board measure. The amount cut and put in the market, is from eighty to one hundred million feet each year. The lumber camps furnish good markets for all kinds of produce, and pay larger prices than could be realized in any other market, as they save the cost of transportation.

There are some ten saw mills in the county, which cut up large amounts of lumber, supplying the home market and sending the remainder to outside markets; several shingle mills also add to our manufacturing interests. Grist Mills sufficient for the business to be done are located in various sections of the county. Valuable ledges of lime-stone furnish an abundance of good fresh lime, cheap for all necessary purposes. Good building stone of various kinds is quarried at several points within the county. Good clay for brick and other purposes is abundant, and brick are manufactured at reasonable prices.

Although a new county, Shawano can boast of as much public spirit as many an older county. Good roads have been built through the county, in all directions, and have been extended to commercial points beyond; there are good roads to Green Bay, Appleton, Oshkosh and to Oconto and the United States military road passes through the county to the copper regions on Lake Superior. Good bridges have been built over the Wolf, Oconto and Embarrass Rivers. A good court house on a two acre lot in the village of Shawano comprises the county property. Good school houses will be found in every town, while several are of more than ordinary style and finish.

Thousands of acres of land in this county are waiting for the industrious and hardy emigrant. These lands can be purchased of the United States government, or of the state at a low price, and every acre of land held by individuals is offered in small lots at low prices, and with long time. For a poor man, or one with little means, this county offers superior advantages, while the man of means will here find a chance to invest to the best of advantage. Wood is cheap, land is plenty, water power is abundant, and the demand for business good. The county is well watered; it is fertile, yield-

ing good crops of all kinds; it is well wooded; it is at the head of navigation on the Wolf river, thus enabling heavy freight to be brought from New York by way of the lakes direct to the village of Shawano, or by way of the Mississippi through the Fox and Wisconsin rivers, and up the Wolf; it is a healthy and rapidly growing county, yet in its infancy; it is a county where intelligence and education are permanently secured, where all of the necessities, and most of the comforts of life are easily accessible; where agriculture, one of the chief sources of wealth, is conducted with success and profit; and where land can be obtained at fair prices, so that all can purchase.

SHEBOYGAN COUNTY.

BY J. H. DENISON, SHEBOYGAN FALLS.

The first settlement in this county was made at the mouth of the Sheboygan river, as early as 1836, but the financial tempest that swept over the land a year or two after so completely destroyed the new town that in 1840 but a single inhabitant remained. A few families, however, had removed up the river, five miles, to the falls, and in that vicinity they remained, and were the nucleus of a future settlement.

In the beginning of 1844 the population of the county did not exceed one hundred, and it was not until the spring of 1845 that emigration was really directed to this region. Then farmers from New England, New York and Ohio began to locate land and open clearings. In 1846 and 1847 still larger numbers arrived, but many, repelled by the forbidding aspect of so dense a wilderness, hastened through the Sheboygan woods to find some place requiring less toil. About this time the Germans began to arrive and settle in the north and east, and the Hollanders in the south; these with a few from England and Ireland, together with the Americans already on the ground, soon occupied the remaining portions of the county. In 1850 the population had reached 8,000, and in 1855 it rose to 20,000; now it is over 31,000.

The timber on the land along the Sheboygan river, and for a few miles up the Onion river, is pine and hard wood. On the low land, elm, basswood, ash, etc. That of other portions is hard wood; chiefly oak, maple, beech, ash, etc. There is an occasional swamp of tamarack or cedar, which increase in value as the country becomes older. The surface of the eastern part is undulating, except along the streams, where it is somewhat broken. The western part is cut up by a range of hills and hollows, known as the Kettles, where the soil is either gravel or sandy loam, except the low lands where it is alluvial. The subsoil is pretty uniformly the red clay, of which the cream colored brick are made. There is little danger that this land will ever wear out if properly cultivated.

The wheat grown both upon the gravelly soil of the kettles and upon the clay land of the eastern towns is of fine quality, and generally yields well, having been heretofore the farmers chief dependence. The crop in the year 1869 amounted to 570,000 bushels. The amount of oats, corn, rye and barley together, would double this sum. Green peas are grown considerably here, of which near 40,000 bushels were exported during the past year, chiefly to St. Louis and Philadelphia, where after a certain preparation they are canned and sold for green (unripe) peas. The peculiar cultivation of this variety consists in cutting at the right time, and curing so as to preserve the green color, which, if lost by exposure to the sun, cannot be restored. If of good quality, they will often bring nearly double the price of ordinary field peas.

The dairy and stock raising business is beginning to take the lead in some localities, and will eventually be the chief business of most farmers. The native grasses, June grass and white clover, flourish without seeding, often covering the ground with a thick coat which, by a system of top-dressing, will make superior pasture for a generation without being disturbed by the plow. The chief dependence for hay is timothy and red top on the low land, and timothy and red clover on the higher ground, the latter often freezes out, and the native grasses are inclined to occupy the place.

The stock of cattle is mostly the native, frequently graded with Durham, Devon or Ayrshire, while a few of pure blood may be found. The products of the dairy are 700,000 pounds of butter, finding a market at home, at Chicago and New York; 315,009 pounds of cheese. The cheese was made from about 900 cows, at an average of 350 pounds to the cow, an average thought to be sufficiently low, as the milk from the best native cows will make from 400 to 600 pounds of cheese in 200 days. The fifteen or sixteen cheese factories are owned by men of enterprise and intelligence. They are yearly extending their business, and their facilities for manufacturing a superior article, which they intend shall compete with the finest products of the country. Already some of the best cheese arriving at Chicago is from this county.

The history of fruit-growing is one of discouragement and loss to the first settlers; although the small fruits grew readily, apples, pears and plums were often a failure. This was owing in part to the rigor of the climate; to the raw, uncultivated condition of the soil; to the bark lice, that threatened at one time to destroy the apple trees; to want of knowledge in cultivating; but especially to want of varieties adapted to the climate. These several difficulties have been mainly overcome, and the fruit interest is becoming one of the most attractive features of farm life. Our nursery-men, after repeated experiments and failures have at length been able to select about thirty varieties of apples adapted to the climate. Although many farmers have neglected the planting of fruit trees, yet the entire amount of apples raised the last year would exceed 30,000 bushels.

Manufactured goods, as well as agricultural products, are increasing from year to year. The sum of farm products for the year 1869, is placed in the late census at about \$2,000,000. The value of manufactures for the present year would nearly reach that sum. The chief articles are flour, lumber wagons; furniture, leather, etc. Two woolen mills at Sheboygan Falls turn out about \$75,000 worth of woolen cloths, blankets, etc., yearly. There are twenty grist and flouring mills, supplied almost entirely with grain produced in the county. The market, aside from home demand, is New England and New York. Twelve thousand barrels of flour are annually sent from a single mill at the Falls to Providence, Rhode Island.

Commerce, so nearly allied to agriculture and manufactures, possesses superior facilities at Sheboygan, where surplus products of this county, as well as much from adjoining counties, find an outlet. The completed railroad to Fond du Lac, and the harbor improved so that loaded vessels of the largest class may pass out and in without obstruction, has added much to the present and prospective importance of this city.

A court house has recently been built here, at a cost of \$65,000, also several churches and numerous brick blocks, which together with the manufactories erected here recently, improve the aspect as well as the business of the place. When it is remembered that manufactories in the county are still in their infancy, that many of the numerous water powers on the streams are still unimproved or occupied by saw mills that must for want of timber soon give place to other machinery; that many articles now imported from the east may be made more cheaply here, both on account of a more ready access to the raw material and on account of living and building more cheaply, it is certain that manufactures and commerce will eventually continue to advance.

TREMPEALEAU COUNTY.

The area of this county is about twenty townships. Of these only about 66,674 acres are improved. The soil is quite varied in its character; in some places, along the river bottom lands, there are patches where sand predominates, but much the greater portion of these lands are susceptible of cultivation and yield good crops. With this exception the soil is a rich, vegetable loam, underlaid with a clay subsoil. All the vegetables and cereals common to our state are easily raised here. Wheat, both winter and spring, is largely grown, and does well. The amount of our agricultural productions, as taken in the late census, is given as follows: Of wheat, 516,664 bushels; of oats, 246,196 bushels; of corn, 147,550 bushels; of rye 10,130 bushels; of potatoes, 47,653 bushels; of butter, 341,068 pounds; of wool, 38,523 pounds.

The surface of the county is somewhat broken; along the courses of the

rivers is generally a strip of level bottom land, varying in width; these usually terminate in sharp ridges or bluffs, with an undulating or rolling surface at the summit. These bluffs are composed of potsdam sandstone at the base, capped with magnesian limestone and vegetable loam. The sandstone is usually from 200 to 450 feet thick, while the limestone is from 20 to 50 feet.

The county is well watered. The Mississippi forms part of its southern boundary, and the Black, Buffalo and Trempealeau rivers, with their tributaries, pass through different sections of the county. Besides these we have the Beaver and Tamarack creeks, with trout brooks and innumerable springs of soft water.

Most of the streams are lined with belts of hard wood timber, consisting mainly of oak, maple, ash and basswood. On some of the small creeks there are belts of tamarack. The balance of the timber is principally white and burr oak. In the northern portion of the county the timber is not abundant; in the southern and western part there is a good supply. The climate is dry and healthy. The temperature of our winters is cold yet even, with less snow than in some other portions of the state; it seldom thaws so as to be muddy, and is really warmer than in more southern latitudes. Much of this county is thinly settled, but as the land is cheap and of excellent quality, and the demand for farm products is great, we hope at no distant day to be able to compete with any of the older settled counties of the state.

VERNON COUNTY.

BY G. W. NUZUM, VIROQUA.

Vernon county is situated in the western part of the state, between 43d and 44th degree of latitude; its western border for 22 miles being watered by the Mississippi river. The soil is good, and covered with a heavy growth of hard wood timber, such as is usually found in timbered countries. The product of small grain is equal, per acre, to any part of the state, and in vegetables it excels the prairie. The surface of the county is rolling, and in some place hilly, but all valuable for timber on such portions as cannot be cultivated. It is well watered by springs and brooks, and well adapted for grazing purposes, for which it will soon become noted. Like all timbered land, it is natural for grass and having abundance of water, it will soon become the dairying portion of the state. With an abundance of water power furnished by the Baraboo and Kickapoo rivers, and a superior quality of timber that could be used for the manufacture of furniture and agricultural implements, this part of Vernon county offers inducements equal to any part of the state. We have in prospect a railroad known as the Baraboo Air Line, from Chigo to La Crosse, which as now surveyed will traverse

this county from east to west, making us a market for our produce as well as our timber. The two principal places of business in this portion of the county are Hillsborough, in the valley of the Baraboo, and Ontario, in the Kickapoo valley. Each of these places are supplied with mills and machine shops of all kinds to supply the wants of the country, stores, with a supply of goods sufficient in quantity and quality for the market.

The raising of stock in this portion of the county has become a prominent feature with the husbandman, producing the best quality of grass fed stock that finds its way to Milwaukee or Chicago market.

The first attempt to raise fruit was attended with little success; many were disheartened and gave up, others preserved and have met with success. We have a few "iron clad" varieties that do well. The first is the Haas, next Tetofsky and Duchess of Oldenburg. Some others have proved valuable. Of grapes the Concord and Delaware have done nobly.

The population of Vernon county is 18,673; in 1860 it was 11,007. Improved lands, of which we have 94,967 acres, are worth from \$15 to \$30 per acre; unimproved cost from \$3 to \$10. We raised in 1870 of wheat 526,098 bushels; rye 2,759 bushels; corn 272,424 bushels; oats 236,436 bushels; potatoes 74,504 bushels; wool 61,000 pounds; the total value of our productions was \$470,765. Our citizens are intelligent and industrious, but we need thousands more, both laborers and capitalists, to develop our resources.

WALWORTH COUNTY.

BY DAVID WILLIAMS, DARIEN.

The past ten years have been quite eventful in modes, methods, character and profit of agriculture and the kindred arts in this county. While the past internecine war greatly changed the character of some of our political institutions, it did not fail to work many changes in agriculture and manufacture. In this county the demand for able bodied men to fill the ranks of our patriotic armies, caused a paucity of laborers, and at the same time the increased demand for farm products and manufactured articles, stimulated production in every branch of industry. This combination of circumstances induced the introduction of machinery, wherever it could be made to serve in the place of human muscle—and this demand in turn quickened the manufacture of agricultural machinery, and challenged the best inventive genius of the age. And our agricultural machinery to-day seems to have approached perfection. Tillers of the soil are to-day far more indebted to applied science than it was believed they would have been but for the quickening forces of the necessities and demands incident to war's exactions. Ten years ago the mower was common, it is true, but so was the scythe—and so of the reaper and cradle. Now the mower and

reaper are on most every farm, and the scythe and grain cradle but little used; the drill or broadcast seed sower have nearly driven the harrow into disuse; and the old time-honored hoe too, has yielded its preeminence in the corn field to the sulky cultivator and the sheep. Yes, strange as it may appear, we have not a few farmers (and good ones too) of this county, who depend on their sheep to clean their cornfields of weeds, more than on the use of the hoe. After the corn is well grown, so that the ears are out of the reach of the sheep, and the soil is dry, the flock of sheep are called into the field, and glean the weeds more effectually than ever the hoe would do. It is done at so late a period, that the corn shading them, will usually prevent a second growth. As corn is now a more leading and valuable crop than it used to be, and the fields are more completely stocked with weeds, if this method of sheep-hoeing can succeed as well as it is claimed by some, it will be of very great use to such farmers as grow a large amount of corn.

With the mowing machine, sulky horse rake and horse pitch-fork, haying is so changed from the old muscle-exhausting process, as to become the most pleasant, if not the easiest part of farm labor. The plow, too, has materially changed under the guiding hands of applied science, losing some of its more abrupt angles, and gaining largely from the use of improved material in its manufacture. But it is still the old wedge, packing the soil beneath it as it is driven through the soil. Though it has gained largely in ease of draught and durability of material, it still offers the most tempting field for inventive genius and scientific study. It is to be hoped that the day is not far distant when the farmer will be able to lift a portion of the soil loose, without packing that portion directly beneath it to an injurious extent.

A marked improvement is noticeable in the more diversified husbandry of the county. Few farmers are now exclusive grain-growers. On more than nine-tenths of the farms of the county more or less stock will be found growing. From 1862 to 1866 sheep were the favorite stock, and took precedence in value and importance of any, or all other stock. The past three years have greatly changed this condition, and to-day sheep are unpopular with our farmers, and have been sacrificed to a very great extent, and now the flocks of the county will not number over one-half what they did in 1865; but other stock has increased in numbers very considerably, especially horses and milch cows. The working oxen have nearly disappeared from the fields of our farmers, and it is doubtful if there are as many young cattle as there were four years ago. The quite prevalent practice of slaughtering calves when a few days old, to obtain greater profits from the milk, has worked, and will continue to work, a great injury to farmers. Our cheese factories are chargeable for a large per cent. of this; though butter at thirty to forty cents a pound has induced some. With those who have their milk worked up in factories, the young calf is in the way of their profits, as all the

milk retained from the factory interferes with the profits of the manufacture, and with cheese at fourteen to eighteen cents a pound, the farmer can figure the cost of raising his calves too well to give the calf much chance for his life. It is estimated that in this county fully five hundred young calves were slaughtered at three or four days old, last year. While our farmers are furnishing more beef than formerly, they use more animal life proportionately to the hundred pounds of beef. Four years ago, three and four year old beeves were quite common; in fact two year old beef, stall fed, was very uncommon. But now, most of the steers raised in the county are marketed before they are three years old, going into the stalls at two past; a full grown beef—except it be one brought into the county, or a superannuated or worthless cow—is rarely found. This questionable practice requires about fifteen to twenty per cent. more animal life to produce a given amount of beef than the former practice of our farmers, of feeding their steers at three or four years old.

Hog raising and pork making have increased in a marked degree, and for the past ten years has given our farmers the fairest sum of net profit of any branch of their industries. In this branch of industry there is the most radical and noticable change. Up to 1860 a very large per cent. of pork raised in the county was slaughtered on the farm; now but a very small per cent. is, being mostly sold on foot and taken to the cities for slaughter.

The advent of cheese factories is having a noticeable effect on the stock of the county, or in producing a condition of things that will soon produce a marked effect on our stock of cattle. As with those farmers who produce milk for the factories, the character of their cows is of very little consequence, so they produce a large quantity of milk, their interest is so little effected by the quality, other than mere milk producing, that they have lost, or will soon lose, all desire of improving the quality of the stock of cattle. And it is believed that not as much interest is felt in improving the neat stock of the county as was manifest three years ago. Another reason is found in the fact, that, some of our improved stock-breeders seek perfection in form and beef producing qualities, and in not a few stock of blooded cattle the milking qualities are bred out. And until our high bred stock raisers shall have succeeded in producing a strain of stock with as good a reputation for milk as for beef producing qualities, there is but small hope that our farmers will be re-awakened to their former efforts to improve their stock of cattle.

In horses there is a noticeable improvement. The slender shanked, nervous and vicious tempered descendant of some remotely connected thorough-bred English race horse, is not as popular as in days (it is to be hoped forever) gone by; and the heavy, strong limbed and kind tempered draught horse is by far more popular, and is more highly prized than formerly. We have a few farmers who do not think it either desirable or profi-

table to raise a class of horses so poorly qualified for farm labor as these slender, wee things are, merely to able to drive to town at a two-forty gait.

As I have before intimated, sheep raising is at a discount with our farmers now, and very little is said or thought of big fleeces: Sheep have lost their dominating position of interest with our farmers, to be regained only when the price of wool returns to seventy-five cents a pound, or the price of other farm products are proportionately lower. But the wool growing mania worked a very great benefit to our farmers, as it checked grain growing, and gave our tilled fields rest and manure. Fortunately the rapidly increasing interest in dairying is taking its place, giving our fields still more rest and manure. The advantage of this was seen in a marked degree last year, in the superior crops produced in that section of the county where sheep and cows were most numerous. And it, most assuredly, will be a fortunate day for our farms and farmers when wheat is no longer king.

No very marked change in methods of tilth has obtained with our farmers from the old-time custom; no system of rotation is practiced to any extent. Chance, and seeming fitness, guiding our farmer mainly, except in such isolated cases where necessity commands, though the same variety of crops is not as frequently grown in succession as in years past. But while our farmers are without any fixed system of rotation, all our best farmers pursue methods looking in some degree to an improvement of the soil, seeding with clover and timothy after a few years in grain, laying them by in pasture or meadow from two to four or more years, to be broken up in September or October, followed by oats, wheat or corn in the spring, and kept in tilth from three to five years, succeeded by a similar length of time in grass is the most common custom. Very little winter grain is grown in the county, and of that little, fully three fourths is rye. A few of our farmers have of late years tried rye as forage crop and grain crop combined, and think very favorable of it. The method practiced is to seed with rye early in the fall—August or early in September—giving, if not wet, pasture for your cows through October and until winter sets in, and again in early spring up to May 10th or June first, then laid by for a grain crop. This, in most cases, gives a full crop of grain, the fall and spring pasturing not seeming to injure or diminish the yield of grain, but giving in most cases a shorter straw. Even if the grain yield is diminished by a sixth or eighth, the superior character of the pasture for butter making will amply repay all losses in that direction.

Little, and but very little progress has been made in beautifying our streets and highways by tree-planting, owing to the prevalent habit of pasturing the public thoroughfares by both cattle and horses. There are a few localities where this is not permitted, but in most of the county the highways are treated as commons, free to all who choose to use them as pasture,—not that our laws are without preventative enactments, but custom rules.

Of the varieties of crops raised in the county, there has been but little change in the past ten years. Wheat, corn and oats continue to be the leading crops. Broom corn is raised to a far greater extent than formerly; not less than five hundred tons of brush was raised last year. Hops have been raised to a considerable extent during the past three years, and has proved a losing crop. Sorghum, a quite popular crop from 1862 to 1866, has entirely disappeared from our fields. No new varieties of grain have come into popular favor in the past ten years, though a considerable effort has been made by interested parties to introduce the Norway or Ramsdale oat, at fabulous prices; but the only profit secured so far, has been bagged by the parties selling the seed.

In manufacturing industries, there has been a marked improvement within the past decade. Ten years ago the manufactures of the county were limited to a few agricultural implements and flour, with a small amount of lumber sawn from the trees of our native forests. Last year our manufactories turned out articles of considerable over a million dollars in value, exclusive of flour and feed. Of this amount, nearly three-fourths was produced in the village of Whitewater—mostly agricultural implements. The only woolen factory in the county is at Geneva, where there has been a thriving business done. The factory runs what is termed two sets of spindles, but this branch of manufactures is not quite as successful as formerly. The past decade has witnessed a very great improvement in farm buildings, and farm improvements generally. The old log houses have nearly all disappeared, and with them have gone the unsightly straw covered stables and graneries.

A marked improvement is noticeable in fruit raising. Our orchards have not only greatly increased in number and extent, but have improved in thrift and general appearance. The small fruits are also raised in vastly greater quantities. All hardy varieties of berries prove productive and profitable. Grapes are also raised to a considerable extent. In public buildings there has been a decided improvement during the past decade, especially in school buildings; there being four public school houses in the county that cost, with their surroundings of yards and out buildings, from \$15,000 to \$20,000 each. And our country district school houses have very greatly improved also. In road making nothing new has obtained—though our highways are steadily improving. In brief, we are pushed a little a head by the quickening forces of 1860 and 1870, but the field of improvement is still only partially occupied, and challenges our best efforts by its numerous needs.

WASHINGTON COUNTY.

BY WM. BOHN, YOUNG HICKORY.

Washington county embraces in its limits twelve townships, and is twenty-four miles long, from north to south, and eighteen miles wide. In climate and soil it is well adapted for the production of grain, especially wheat, as the returns from the census of 1870 will show. From 147,549 acres of improved land, which includes much that is only fenced, not cultivated, we raised 714,094 bushels of wheat; 76,192 of rye; 208,761 of corn; 398,507 of oats; 64,549 of barley; 186,692 of potatoes; 638,304 pounds of butter, and 3,980 pounds of cheese. The total value of our agricultural products was nearly \$2,000,000.

The Milwaukee river, and the Cedar and Rubicon creeks, with their tributaries furnish abundant water for general purposes, and for motive power. The La Crosse and Milwaukee Railroad passes through the county. Hartford, Richfield and Schleisingerville are good wheat and general produce markets. At Hartford we have an undeveloped bed of iron ore, of the same quality as that at Iron Ridge, which will eventually be of great benefit to the industrial interests of our county and state.

The county is strictly agricultural. More than nine-tenths of the inhabitants follow agricultural pursuits. Farming is carried on by many on an improved and more rational system, with proper rotation of crops. Wool-growing is of less account than in former years, in consequence of the unprofitableness of the business; two-thirds of the number of sheep were disposed of during the last four years. Cattle and horses are raised in considerable numbers; the former mostly of the native breed, with some strains of Durham and Devon blood. A good stock of horses are found all over the county; mostly grades of Morgan and French. At present the rage is for raising heavy horses. Some three years ago Clydesdale stallions were brought into the county, and many colts, the offsprings of said stallions, very promising animals, are scattered through the county.

In the southeast part of the county there is a quarry of fine building stone; also another quarry is opened near the county farm. An abundance of hard wood timber and tamarack is found in all parts of the county.

WAUKESHA COUNTY.

BY W. D. BACON, WAUKESHA.

Waukesha county, in its territorial conformation, presents the figure of a square, and contains an area of about 368,640 acres of land. There are sixteen townships in the county, each of which is square, with six lineal

miles to a side. The county first commenced to be settled in 1835 and 1836 by farmers taking up land at that time in the townships of Waukesha, Pewaukee, Mukwanago and New Berlin.

The soil is various, but mostly loam and clay; it consists of timber, prairie, openings and marsh conveniently diversified, so that settlers could find a farm suited in every respect to their taste. It is well watered with springs, brooks, rivers and lakes abounding with fish. The soil is easy of culture; mixed in its native state with lime particles, and is adapted to the growth of all kinds of grain and crops common to this latitude, especially for wheat, rye, oats, barley, corn, potatoes, beans, flax turnips, and all varieties of staple grasses for hay and pasture. Its surface is gently rolling, interspersed with level plains of land; only a small portion being hilly, and less still that is bluff.

The climate and soil may be said to be highly adapted to grain, stock-raising and dairying, and yields full compensation to capital and labor invested in those branches of industry.

Apples, pears, plums and peaches do not grow as naturally as in some localities in some of the other states, yet we may say that apples are raised in quantities more than sufficient to supply the wants of the county, and pears and plums in some seasons bear profusely. Over 100 different varieties of apples raised in this county were exhibited at our last county fair. Some farms with ten acres set out with apple trees raise from 250 to 500 bushels annually, and our orchards yet are all young. Small fruits, such as currants, strawberries and raspberries grow abundantly. Grapes are grown to some extent, and some seasons in large quantities.

Considerable attention is given to raising various breeds of herded stock. The climate is well adapted for sheep. The county may be said to be noted for its large flocks of sheep, and its valuable stock of cattle. There is a good class of horses raised in the county, and considerable attention paid to colt stock. Waukesha for two years successively, has received the award of the prize banner and cash premiums offered by the state agricultural society for largest and best collection of stock, farm products, and articles raised and manufactured within the county.

The county is situated directly west of Milwaukee, and its average distance is less than 25 miles from the city, its nearest being 8 miles. Its county seat is at the village of Waukesha, nearly in the geographical centre of the county. Two railroads traverse the county, giving first class privileges for travel and transportation from all parts.

No mineral deposits have yet been discovered, but quarries of stone abound, of the finest quality for building purposes; and a large trade, to all parts of the state, is furnished both in stone and lime. The stone in the quarries are in layers from 3 to 16 inches in thickness, and for building purposes are very durable. The broken edges are of a cream color, and if pains are taken, selections can always be made for face walls that will never tarnish.

Structures built 30 years ago of these stone, have as clean and fresh an appearance as if built but yesterday. Peat is found in large quantities, and if ever necessary may be utilized to an unlimited extent.

A mineral spring has recently been discovered at Waukesha, named "Bethseda," and is celebrated for its curative properties for many chronic diseases. In drinking no trace of mineral is discovered by the taste. The water is pure and limpid, giving to the taste and palate an invigorating sweetness and relish.

A growing interest prevails in favor of manufacturing. One woolen factory is now in operation at Waukesha, having three sets manufacturing cards, one set of custom cards, six spinning jacks with one 160-spindle-twister—in all over 1500 spindles and 16 broad looms, with the requisite finishing machinery to make a first class mill. It works up from 110,000 to 125,000 pounds of wool annually. The patterns of the shawls manufactured here are in large demand, and so popular are they that Messrs. Field, Leiter & Co., of Chicago, have contracted to take all the mill can make for three years; the capacity of the mill for shawls alone will be 30,000 annually.

The educational interests of the county, generally, are very well sustained. Its common schools are well conducted. At Oconomowoc an excellent and well conducted ladies seminary is in successful operation. At Nashota, the Episcopal society have a theological institute. At Waukesha, under the patronage of the Presbyterian society of the state, Carroll College is located, and under its efficient and well qualified management, is steadily advancing, and by its merit is attracting full classes to its halls.

WAUPACA COUNTY.

BY J. WAKEFIELD, FREMONT.

Waupaca county contains twenty-one townships and 756 square miles. The eastern and northeastern part of the county is heavily timbered, consisting of hard and soft maple, oak, birch, cherry, butternut, hickory, ash, elm, basswood, pine, tamarack, etc. The rest of the county is mainly oak openings; about three-fifths is timbered land. The surface of the county is gently undulating, except in a few places in the west and northwest, where it is somewhat broken by high hills and bluffs. The soil in the timber varies from a light sand on the pine ridges, to a stiff, tenacious clay. The sand, although light, can be kept in "heart" easily, and pays well for the trouble and expense of cultivation; corn, buckwheat, beans and potatoes do best on the light soils, while wheat, peas, oats and the grasses show a decided partiality for clay or a heavy loam. The openings are generally more sandy than the greatest share of the pine timber lands. Yet there is much excellent soil to be found there, dark, rich, and, in many places, quite

tenacious, yielding the best of crops, and easily worked. Winter wheat seldom kills out, and much is raised; spring wheat also does remarkably well; no county in the state can beat ours, and but few equal it in the quality of that grain, although some excel us in the quantity on a given number of acres. Corn is a pretty sure crop. Even dent corn, which cannot be raised in the same latitude east, seldom fails here, and is the crop with us.

The cultivated grasses do well in the timber—better than in the openings; red clover thrives, and is getting to be extensively cultivated, not only for stock, but to turn under as a renovater of the soil. The wild grasses are very plenty, and very rich and nutritious, proving a great blessing to the hardy pioneer, who has to depend upon them for his stock to subsist on during the summer, and for his winter's supply of fodder.

Our woods are full of a species of wild bean, which is eagerly sought after by stock. There is also a kind of wild pea, which grows on the uplands, much relished by stock. It is likewise very plenty in our natural meadows, in places, growing often three or four feet high, and making excellent hay. Although we cannot let our cattle run at large during the winter, and have them thrive on what forage they can pick up, yet, with proper care and generous treatment, the raising of stock can be made to pay here, and pay well. But few pure bloods have been brought into our county, still, some of our most energetic farmers are doing something to improve the breeds. The "short horns" and their crosses appear to be the most popular, although some have introduced the Devons. In horses, we have but little fine stock, although we have some that will compare favorably with those found in surrounding counties. We have some fine trotters. Sheep raising is still in its infancy. But it will yet become a profitable branch of husbandry in many parts of the county.

Although fruit raising has been much neglected, yet enough has been done to show that apples, pears, plums and cherries will do well here, and not only pay for their cultivation but may be made a remunerative crop when raised for the market. There are in our county some fine orchards in bearing condition, and many more that in a short time will begin to pay back the trouble and expense bestowed upon them. Blackberries, red and black raspberries, strawberries, gooseberries, huckleberries and cranberries grow wild in profusion. Scarcely a marsh or tamarack swamp is to be found where the cranberry has not obtained a footing. Thousands of bushels are gathered, and sent off to eastern and southern markets. Grapes may be successfully cultivated, especially around our lakes, and along our larger streams; but it is a question if they can be generally raised for the market.

For the past two years our potato fields have suffered much from that pest the Colorado potato bug. Some fields have been entirely destroyed, every leaf, and even nearly all the stalks devoured.

In the northeast and eastern part of the county is much valuable pine tim-

ber, especially along the course of the principal streams, and tributaries; and much lumbering is done, giving employment to many hands. The logs are mostly floated down the stream into the Wolf river, and down that to the "boom," a few miles below the south line of our county and there sorted, and then rafted and towed by steam tugs to where they are wanted. It is computed that two hundred and fifty million feet of logs annually pass down the Wolf river, from and through this county.

The Wolf river flows through the eastern part of the county. It is a large stream, navigable for steamboats at all stages of the water. The Little Wolf empties into the Wolf, and is valuable on account of its excellent water powers. So also, is the Embarrass, which empties into the Wolf at New London. The Waupaca river also possesses valuable water powers. The Pigeon river in the northern, and Little river in the southern part of the county, are both used for turning machinery.

There are several flourishing villages in our county. Waupaca, the county seat, is situated on the Waupaca river, about 13 miles from its mouth. It has 7 dry goods stores, 3 drug stores, 2 banks, and the usual amount of shops and business places. It also has two flouring mills which manufacture large quantities of flour, and ship 500 tons of feed annually to the pineries; also a woolen mill using \$17,000 worth of wool yearly, making excellent cloth, flannels, etc. The high school building, 55 by 75 feet, is the best of the kind in the county.

On the first Saturday in every month a fair is held in Waupaca, to enable farmers having stock for sale to dispose of the same. They are largely attended, and recommend themselves to the favorable consideration of all. A county agricultural society is about being organized under favorable auspices.

New London, another thriving town, is situated on the Wolf river, and at present is at the head of steamboat navigation, a place of much business. The Green Bay and Lake Pepin railroad will pass through the village, and will make it quite an important point.

Weyauwega, another growing town, lies on the Waupaca river, about three miles from its mouth. It has an excellent water power, which is well improved.

Fremont is another village, situated on each side of the Wolf river, near the southeast corner of the county. It is the headquarters of manufacture and trade for a large extent of country around. It has a bed of clay, said to be equal to any for the manufacture of light colored stone or earthenware, or brick. It is in the timber, and has good farming land around it, which is fast becoming settled. Besides these there are several other villages in the county, where a considerable amount of business is done.

Two railroads have been chartered, and are now being rapidly built, passing through our county, which when completed must add greatly to our prosperity, and assist materially in developing our resources. The Green

Bay and Lake Pepin railroad is to pass through the north part of the county, crossing the Wolf river at New London; and the Central Wisconsin entering the county near the southeast corner, passes through in a northwest course to lake Superior. When both roads are built and in successful operation, in connection with our steam-boat navigation on the Wolf river, we believe that the next ten years will bring about a material rise in all kinds of real estate, and give an impulse to the settlement of our county heretofore unknown.

The population of our county in 1860 was 8,850, now it has increased to about 15,560. A majority of our people are from the eastern and middle states, although we have a large foreign population in some towns.

While our winters are probably nearly as cold as in those places in the same latitude east, we have much less snow, in fact, often not enough for permanent good sleighing during the whole season. Vegetation starts rather late in the spring, but it is made up to us when it does get started. Things grow very rapid, and come to maturity early. Our summers are delightful; the air being bracing, healthy and invigorating. We have no febrile diseases; miasma is a thing unknown.

There is much here to lure the immigrant in his journey west in search of a permanent home; our fertile soil, cheap lands, healthy climate, good water, our sober, intelligent population, our improvements and natural resources, our good markets, our schools, churches, all will tend to make Wisconsin one of the most desirable states of the great west, and make her counties rich and populous; among which not the most insignificant will be ranked Waupaca county.

WAUSHARA COUNTY.

BY E. R. MONTGOMERY, HANCOCK.

Waushara county comprises eighteen towns in territory, and is in shape a parallelogram, being eighteen miles wide and thirty-six miles long. The three eastern towns are heavily timbered, with the exception of some quite large tracts of open marsh. These marshes are valuable for the cultivation of cranberries. In the town of Aurora, last year, cranberries were gathered and sold to the amount of \$250,000 worth, adding a large sum to the general wealth and prosperity of the town, and giving profitable employment to several hundred people, including boys and girls, during the picking season. Five years ago all these lands were considered almost worthless. The timbered portion of the six eastern towns are not only valuable for the timber, but the land is of excellent quality, natural for grass or winter wheat, and all other crops that can be raised in this latitude.

The county is well watered by Pine River and Willow creek, both good

mill streams, on which are several saw and grist mills. In addition to these streams, almost every farmer has what he calls a fountain, or flowing well, the water never freezing in the coldest weather in winter, and always sufficient to supply any amount of stock. These wells are from fifty to one hundred and fifty feet deep, and cost from five to twenty-five dollars. Passing from the three eastern towns, we come to the worst abused, most despised portion of Waushara county, simply because the soil is sandy.

In regard to this portion of our county—and I speak from some five years experience—taking into consideration the price of the land, and the amount of labor bestowed upon it, I do not know of any land in this state or any other, where a man can get as good returns for his labor as he can here. Of wheat, we raise from five to thirty bushels per acre, but I think, take the county as a whole, the average crop would be about eight bushels. It never fails to be of good quality, plump, white berry, with thin hull or bran—making up in quality what it lacks in quantity. We always have good rye, and no part of the state can beat us on vegetables of all kinds; potatoes, we raise from 150 bushels to 500 bushels per acre. In fact, there is no kind of vegetable raised in Wisconsin but what we can raise cheaper, with less labor, more per acre, and a better quality, than they can in what is considered the more favored regions of our state. Corn does well here—the soil seems to be just adapted to its growth. It ripens as early as it does in the south part of the state. Clover does well; it never winter kills, and yields from two to three tons per acre, worth the price of unimproved land. In the middle and western portions of the county, such land is worth from three to five dollars per acre.

We have plenty of good flouring mills scattered all over the county. Our facilities for schools and school houses will compare favorably with the older settled portions of the state. The settlers were, most of them, formerly from the eastern states, and take a lively interest in schools and all kinds of improvements. In fact, I think we have got all the elements that are needed to make a rich and prosperous county. We have large beds of marl, equal to the green sand-marl of New Jersey, that we can use as fertilizer with very little expense. We have also large beds of clay that make cream colored brick, and with the same facilities for manufacturing, would be equal to the Milwaukee brick. We have potters' clay that cannot be surpassed by any in the state for stone ware; all we need to develop our resources is railroads to give us a market; I think Waushara county would then take rank among the best agricultural counties in the state. No county in the state can beat us in small fruits, and where the people have given their attention to raising orchards, they have succeeded beyond their most sanguine expectations.

WINNEBAGO COUNTY.

BY HON. R. J. JUDD, OSHKOSH.

Winnebago county contains sixteen townships of farming lands, and includes the city of Oshkosh, and the flourishing villages of Neenah, Menasha, Omro and Winneconne, besides several of less note. Lying on the west shore of lake Winnebago, and in the valleys of the Fox and Wolf, its surface is picturesque and beautiful, and its lands fertile. Its several lakes and rivers furnish some one hundred and fifty miles of navigable waters within its territory and on its borders. Lake Winnebago at its two outlets, Neenah and Menasha, furnishes us unfailing water power which cannot be excelled.

Its position is peculiarly fortunate. Situated on the great water thoroughfare between the lakes and the Mississippi, which is soon to be improved and enlarged by the General Government, it will receive its full share of the general benefits of this improvement, besides realizing some important local advantages. Winnebago is also the natural outlet of the Wolf river pineries. We receive and manufacture a large number of logs, and furnish the supplies to that region.

Its surface is gently rolling, presenting a pleasing variety of woodland, openings, prairie and native hay fields. There are no swamps, and its limited marshes admit of easy drainage and become our most valued lands. The two railroads which traverse this county, the Northwestern and the St. Paul, to which another is about to be added—the Oshkosh and Mississippi—together with its lakes and rivers, afford unusual facilities for cheap transportation and travel.

The soil is of a superior quality, embracing the deep black vegetable mould, marly loam, clay and sandy loam. The subsoil possesses that strong and active fertility which marks the decomposition of lime rock; and from any depth, when thrown to the surface and exposed to atmospheric action, supplies the growth of grasses, vegetables and plants. The lands are well watered. Artesian fountains abound, and are easily obtained.

The topography of the county indicates (what is found to be a fact) a healthy climate. The wheat produced is of a fine quality; the land and climate is suitable for corn, and full crops of these grains are usually obtained. The same may be said of all the other products of this latitude.

Improved breeds of cattle are being introduced, and the raising of stock and the production of butter, and cheese especially, is receiving more attention than formerly.

The apple and the grape find a home here. Our apples have become noted at the State Fairs, both for their excellence and variety. Many regarded as tender in other sections, are here successfully cultivated. The river val-

leys, and lake borders seem also to make the climate especially congenial to the grape.

While Winnebago county has no inconsiderable supply of hard woods, such as the oak, maple, elm, hickory, basswood, butternut, etc., in its native forests, its contiguity to the Wolf river pineries gives its settlers an abundance of pine lumber at their own doors at low prices.

The progress of this county has been rapid in population, production and wealth. Though one of the smallest in area, having but sixteen townships, and ten of these fractional, being largely encroached upon by water, yet in 1870 it had a population of 37,325; which ranks it the sixth among the fifty-eight counties of Wisconsin. In 1860 the population was 23,760; in 1847, 2,748, and in 1840, 732. In 1870 it ranked ninth in the total amount of taxation, which was \$125,716. Its improved lands were 152,937 acres. It produced 791,803 bushels of wheat; 189,845 of corn; 407,212 of oats; 170,059 pounds of wool; 749,187 of butter; 57,811 of cheese; 175,180 of hops; 51,794 tons of hay; 91,510 bushels of potatoes. The value of all its farm products for 1870 being estimated at \$2,377,334, making it the twelfth among the counties in this respect.

Oshkosh, the county seat of Winnebago county, is a city of 12,673 inhabitants. It is beautifully located on both banks of the upper Fox, and also on the west shore of Lake Winnebago, at the point where the river enters the lake; and it has a water frontage of not less than five miles. The site is elevated and healthy, and is liberally sprinkled with native massive oaks. The city covers a surface of nine square miles. It has sixty-two miles of improved streets; 1,565 feet of Nicholson pavement, and some ten miles of graveled streets. The river is spanned by two superior pivot bridges, to which two more are soon to be added. There are in the city fifty-six manufacturing establishments, where steam is the sole propelling agent. Forty-four of these are of wood in its various forms. The different manufactures of lumber in 1870 were valued at \$1,661,107, and all other manufactures at \$984,894, making a grand total of \$2,656,001.

The live stock of this county, in 1870, was, 7,621 horses; 17,213 neat cattle; 84 mules and asses; 37,490 sheep; 7,213 swine; and the total valuation of all property, real and personal, was \$14,439,270—ranking the seventh in wealth in the state.

But this county is mainly distinguished for its manufactures; which, last year, were valued at \$6,312,754, or nearly one-thirteenth of the entire manufactured products of Wisconsin. Winnebago county is indebted to the older states of the east for the bulk of her original settlers, New York, New England and Ohio taking the lead. They brought with them their energy, economy and sagacity, their love of education, good morals and religion. The numerous schools and churches and other institutions of the county will attest how thoroughly they have illustrated in practice their ideas.

Cheap water communication connects Winnebago county with the great

markets of the east. In addition to this the Wolf river pineries and the Lake Superior mining region draw largely on the resources of this county, and the prices obtained by farmers are several per cent. higher than the average in the state.

WOOD COUNTY.

BY L. P. POWERS, GRAND RAPIDS.

The county of Wood is situated nearly in the geographical center of the state, and contains 468 square miles. The surface is level, or slightly rolling, there being but very little broken land in the county. The soil in the southern portion is a sandy loam, interspersed with hay and cranberry marshes; and in the northern portion, embracing about two-thirds of the county, is a deep, rich, clayey loam, well fitted for agricultural purposes. The county is remarkably well watered; the Wisconsin river passes through the eastern portion, the Yellow river (a tributary of the Wisconsin) traverses the entire length of the county from north to south, and the east fork of Black river passes through the western portion. These streams, together with Will Creek, Hemlock Creek, and numerous smaller streams, furnish an abundance of water to all parts of the county. The climate is mild and equable; climatic and miasmatic diseases are almost wholly unknown.

The business of agriculture as yet has been prosecuted to but a limited extent. The larger portion of the population attracted by the magnificent pine forests, and attracted by a desire for more rapid gains, have embarked in the business of lumbering, and have neglected the slower but surer business of tilling the soil, so that the county instead of being an exporter of farming products, has been a large importer. But enough has been done to show that the soil will produce, with proper cultivation, all the field crops common to the climate, in great abundance. The soil is especially adapted to the raising of tame grasses, wheat and oats, together with potatoes and other root crops.

But little has been done in the production of fruits; apples have been raised to some extent, and succeed well.

The strawberry culture, wherever tried, has been successful. Wild fruits, such as plums, cranberries, blackberries, whortleberries and raspberries, are produced in great plenty, and it is believed that no portion of the state is better adapted to fruit culture than Wood county.

Valuable minerals abound. Beds of iron ore, thought to be rich in quality are abundant. Several quarries of building stone have been opened, and tested sufficiently to prove that there is enough of good quality to supply the future wants of the community. "Kaolin," or porcelain clay, pronounced by experts to be the best on the continent, is found in unlimited

quantities. The manufacture of this article alone, when railroads open the country, will build up an industry sufficient to support a thriving city.

The principal industry heretofore, has been the manufacture of lumber. More than thirty years ago, the magnificent pine timber and the superior water power at Grand Rapids, attracted the hardy lumbermen to this region of the state, and, although, the only means of getting the lumber products to market, is by the uncertain floods in the Wisconsin river, yet a business has been built up in this county that now amounts to millions of dollars per annum.

Supported almost entirely by this business there has grown up on the banks of the Wisconsin river, at Grand Rapids, a city of 2,000 inhabitants, (including the village of Centralia.)

The county is forty miles from the nearest railroad, and has no steam-boat communication; but roads are now projected, and being built, that will cross the county in different directions. One, the Green Bay and Lake Pepin road, is contracted to be completed to Grand Rapids by the first day of January, 1872, and several other lines will be built within a few years.

It is believed that no county in the state possesses more of the natural elements of wealth, awaiting development. To the immigrant and laboring man it affords great advantages. Lands are now cheap. Choice hardwood lands can be bought for, from two to five dollars per acre, and are rapidly increasing in value. Good hay and cranberry marshes can be bought of the state for seventy-five cents per acre. Labor commands high prices, and is always in demand.

There is within the county the most valuable water power, taking all things into consideration, to be found in the valley of the Mississippi. The falls in the Wisconsin river, from the head of the Grand Rapids to Point Bass, are ten miles in extent, with an abundant supply of water. The power can be very easily and cheaply improved, and can be used on both sides of the river, and made to propel all the machinery that can be placed upon it.

Two-thirds of the county is now covered with a dense forest of pine and hard-wood timber, embracing all the timber trees common to the climate. The soil, when cleared of its timber, is all that the husbandman can desire.

With all the advantages, that nature has provided with so lavish a hand, it does not require the gift of prophecy to foresee that the county of Wood has before it a brilliant future.

BROWN COUNTY.*

In the limits of this county the first settlement in the state was made; nearly two hundred years ago (in 1672) the Jesuit missionaries established their headquarters at Green Bay. In 1816 the government located a military post there, which was kept up for 35 years. The county was first organized in 1818, under the territorial government of Michigan, and then comprised all the eastern portion of the state of Wisconsin. Its area is now reduced to sixteen townships, or 576 square miles. Lying at the head of Green Bay where the Fox river empties into the bay, and having the best natural harbor on the lake, it possesses commercial advantages unequalled by any county of the state. The completion of the water communication between the lakes and the Mississippi, will still further increase these advantages and give a fresh impetus to its industry.

The county is generally heavily timbered with hard wood, with occasional patches of natural meadow along the streams. Nearly all of the land is susceptible of cultivation. The fertile soil, consisting of clay, black, rich loam and sand, produces largely of all the varieties of grain and vegetables common to our climate. Fruits, such as apples, plums, cherries and grapes do well and are raised in considerable quantities.

The amount of our improved land is 51,192 acres, from which were produced in 1870, 156,783 bushels of wheat; 16,819 bushels of rye; 14,967 bushels of corn; 155,101 bushels of oats; 68,479 bushels of potatoes; 12,341 pounds of wool; 328,622 pounds of butter. The total value of the products of our soil for the year was \$830,692; while that of our manufactures footed up \$2,159,392. This indicates plainly the direction given to our industry. With the best of commercial facilities, an unlimited amount of water power, and an abundance of material for manufacturing purposes, the attention of our citizens was early directed to manufactures; and the same influences will serve to make this the leading interest of our county for years to come.

The leading towns of the county are Green Bay, with a population of 4,666, the seat of a large manufacturing and commercial business; Depere and Fort Howard, both large manufacturing towns, with a population of 1,382 and 2,461 respectively.

The county is well watered; the principal rivers are the Fox, East and Big Suamico; besides these, there are numerous small streams and living springs, which furnish abundant water for stock. On the borders of these streams there are patches of low prairie, which yield large supplies of hay and feed, well adapted for stock raising and dairy purposes.

* Passed over in its order by mistake.

APPENDIX.

“A.”

*STATEMENT of the Valuation of Taxable Property of the several
counties of the state of Wisconsin, in 1860 and 1870.*

COUNTIES.	VALUATION.			
	As Assessed in 1860.	As Assessed in 1870.	As Equalized in 1860.	As Equalized in 1870.
Adams.....	\$1,079,041	\$933,035	\$1,023,872	\$1,143,278
Ashland	90,798	.....	106,492	131,520
Barron.....	.....	325,761	.....	545,422
Dallas.....	104,880	.....	117,594	.....
Bayfield.....	.....	351,109	.....	283,971
La Pointe.....	283,779	.....	134,197	.....
Brown.....	1,657,326	4,066,254	2,045,586	7,868,577
Buffalo.....	457,871	1,171,815	603,829	2,431,999
Burnett.....	.....	166,695	.....	425,888
Calumet.....	724,967	1,382,341	1,343,814	3,566,945
Chippewa.....	753,193	3,102,626	673,952	6,820,547
Clark.....	932,571	1,737,245	649,950	3,979,951
Columbia.....	5,086,243	9,934,812	5,530,887	12,455,565
Crawford.....	1,087,038	2,095,927	1,469,995	3,415,839
Dane.....	11,677,888	20,568,006	13,670,275	27,742,424
Dodge.....	8,325,348	16,750,322	9,033,018	19,860,450
Door.....	481,586	717,857	542,413	1,216,508
Douglas.....	706,984	658,230	724,570	1,009,615
Dunn.....	800,440	2,421,530	637,579	3,437,947
Eau Claire.....	890,556	2,367,748	842,568	4,021,636
Fond du Lac.....	7,244,200	13,327,833	8,546,274	18,981,067
Grant.....	6,738,364	11,306,146	7,672,989	19,435,644
Green.....	4,101,377	8,999,490	5,404,976	13,005,420
Green Lake.....	2,427,163	.....	2,443,526	7,000,000
Iowa.....	3,118,796	6,458,695	4,742,739	11,078,393
Jackson.....	835,301	1,441,706	860,260	2,187,565
Jefferson.....	5,147,247	10,647,202	5,607,137	13,745,878
Juneau.....	1,546,125	2,212,580	1,427,035	2,676,137
Kenosha.....	3,973,150	5,825,331	4,105,604	9,299,133
Kewaunee.....	347,795	559,890	721,013	1,724,912
La Crosse.....	3,114,590	4,970,348	3,584,239	7,568,542
La Fayette.....	3,314,940	6,613,075	4,012,237	10,213,230
Manitowoc.....	1,152,209	3,257,488	2,642,020	7,977,585
Marathon.....	2,017,163	1,407,245	1,662,940	2,502,974
Marquette.....	751,804	1,032,866	761,519	1,002,710
Milwaukee.....	19,020,990	51,275,012	18,893,961	57,457,062
Monroe.....	1,298,031	3,635,143	1,589,715	3,910,090
Oconto.....	1,220,332	1,619,909	1,379,222	7,802,398

STATEMENT of the Valuation of Taxable Property, etc.—continued.

COUNTIES.	VALUATION.			
	As Assessed in 1860.	As Assessed in 1870.	As Equalized in 1860.	As Equalized in 1870.
Outagamie	\$1, 884, 852	\$3, 212, 945	\$2, 078, 021	\$5, 511, 294
Ozaukee	2, 542, 538	3, 279, 109	2, 306, 272	4, 015, 138
Pepin	511, 166	819, 880	438, 849	876, 348
Pierce	1, 170, 664	2, 666, 925	1, 151, 943	4, 085, 681
Polk	550, 661	931, 835	559, 907	1, 361, 314
Portage	1, 613, 584	1, 734, 788	1, 380, 400	2, 790, 359
Racine	5, 783, 477	9, 543, 231	5, 719, 090	12, 409, 430
Richland	1, 436, 709	2, 114, 099	1, 532, 458	4, 000, 000
Rock	13, 963, 573	31, 393, 939	13, 016, 802	25, 000, 000
St. Croix	1, 512, 705	3, 550, 815	1, 521, 798	5, 164, 751
Sauk	4, 213, 240	5, 451, 706	4, 200, 801	9, 000, 000
Shawano	514, 227	348, 329	695, 902	2, 537, 695
Sheboygan	4, 176, 134	7, 908, 365	4, 857, 895	9, 912, 431
Trempealeau	691, 226	1, 866, 355	690, 453	2, 589, 219
Vernon .....	.....	3, 161, 558	.....	5, 692, 402
Bad Ax. }	1, 524, 861	.....	1, 585, 214	.....
Walworth	8, 061, 503	14, 873, 235	8, 004, 503	18, 000, 000
Washington	3, 908, 278	6, 210, 164	4, 125, 111	7, 528, 640
Waukesha	7, 496, 931	14, 793, 202	6, 939, 299	16, 000, 000
Waupaca	1, 295, 039	2, 499, 570	1, 383, 533	3, 100, 295
Waushara	1, 160, 539	1, 621, 869	1, 157, 540	2, 480, 582
Winnebago	4, 043, 305	14, 439, 279	4, 979, 180	15, 012, 500
Wood	705, 171	902, 768	529, 542	905, 893
Totals	\$170, 270, 545	\$326, 765, 238	\$184, 062, 536	\$455, 900, 800

"B."

TABLE showing condition of some of the leading branches of the
Manufactures of Wisconsin in the several Counties. Taken
from the Census Returns of 1870:

ADAMS.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Blacksmiths.....	\$600	\$296	.....	\$800
Flour mills.....	37,000	67,904	a10,684	92,384
Foundries and mach. shops	2,000	390	.....	1,930
Leather manufactures	400	375	.....	625
Lumber.....	32,000	31,390	b3,690,000	56,420
Printing.....	1,250	430	.....	2,600
Wagons, carriages.....	4,600	1,149	.....	2,890
Totals	\$77,250	\$101,934	.....	\$157,649

BROWN.

Agricultural implements ..	\$1,000	\$164	.....	\$1,300
Blacksmiths.....	7,630	7,045	.....	20,575
Breweries.....	122,000	25,355	a9,122	82,298
Builders.....	8,385	30,500	.....	54,609
Building and other material	63,200	31,522	.....	84,903
Cabinet ware.....	9,000	4,045	.....	9,800
Cigars.....	800	2,916	.....	4,632
Cooperage.....	37,200	11,924	.....	58,293
Flour mills.....	69,000	88,521	a13,880	323,922
Foundries and iron works..	323,500	92,878	.....	314,418
Leather manufactures	31,525	28,848	.....	43,348
Logging.....	21,500	30,346	.....	62,624
Lumber.....	692,000	1,305,019	{ b36,075,000 c35,035,000 }	{ 1,510,277
Stone, lime and brick	14,300	2,370	.....	20,428
Tailors.....	5,000	4,000	.....	7,000
Tanneries.....	26,000	16,260	.....	24,460
Tin ware.....	4,700	9,252	.....	16,150
Wagons and carriages.....	21,000	10,717	.....	31,397
Totals	\$1,457,740	\$401,682	.....	\$2,670,434

a barrels.

b lumber.

c shingles.

TABLE showing condition of Manufactures—continued.

BUFFALO.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Blacksmiths.....	\$10,250	\$9,310	.....	\$26,100
Breweries.....	26,500	6,616	a1,825	18,080
Builders.....	4,925	1,000	.....	31,400
Cooperage.....	550	720	.....	3,000
Flour mills.....	57,000	132,250	a37,360	252,680
Leather manufactures.....	5,600	11,400	.....	23,720
Lumber.....	31,500	47,150	{ b6,000,000 c4,673,000 }	68,300
Printing.....	1,500	310	.....	2,600
Stone, lime and brick.....	6,000	.....	.....	15,280
Tailors.....	1,200	630	.....	2,650
Tin ware.....	2,000	4,000	.....	6,500
Wagons and carriages.....	3,050	2,900	.....	8,000
Totals.....	\$150,075	\$216,286	.....	\$438,310

CALUMET.

Blacksmiths.....	\$4,150	\$4,195	.....	\$8,964
Breweries.....	2,000	1,080	a730	5,840
Cabinet ware.....	4,500	347	.....	3,214
Flour mills.....	15,500	26,050	a1,500	33,070
Leather manufactures.....	8,250	7,985	.....	18,850
Lumber.....	59,500	22,436	c4,114,000	33,985
Pearlash.....	150	180	.....	650
Stone, lime and brick.....	12,200	3,308	.....	11,250
Tin ware.....	4,700	2,795	.....	5,265
Wagons and carriages.....	2,000	855	.....	4,370
Totals.....	\$112,950	\$69,231	.....	\$120,458

CHIPPEWA.

Blacksmiths.....	\$2,800	\$8,430	.....	\$29,950
Breweries.....	3,000	.....	a1,000	15,000
Builders.....	9,840	41,452	.....	198,350
Building material.....	10,000	1,500	.....	5,500
Cooperage.....	650	1,500	.....	5,300
Flour mills.....	62,000	52,850	a12,750	72,950
Leather manufactures.....	4,950	6,610	.....	18,200
Lumber.....	1,105,000	539,405	{ b88,000,000 c64,526,000 }	968,713
Totals.....	\$1,198,240	\$651,747	.....	\$1,313,963

a barrels.

b shingles.

c lumber.

TABLE showing condition of Manufactures—continued.

CLARK.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Blacksmiths	\$3,350	\$4,300	.....	\$11,800
Breweries	7,000	1,600	.....	3,960
Building material.....	3,000	2,200	.....	5,000
Cabinet ware	2,500	1,627	.....	3,696
Cooperage.....	700	200	.....	675
Flour mills.....	8,000	11,790	<i>a</i> 1,950	15,000
Leather manufactures	1,800	3,945	.....	9,590
Lumber	73,600	24,055	<i>b</i> 6,450,000	63,025
Printing	5,500	1,700	.....	7,000
Totals	\$105,450	\$51,417	.....	\$119,746

COLUMBIA.

Agricultural implements ..	\$7,000	\$3,000	.....	\$9,250
Blacksmith	12,800	5,444	.....	20,435
Breweries	107,200	16,318	<i>a</i> 310	38,680
Building material.....	29,000	22,000	.....	36,300
Cabinet ware	2,300	1,400	.....	3,700
Cigars	2,500	2,000	.....	9,300
Cooperage.....	200	100	.....	763
Flour mills.....	173,200	216,351	<i>a</i> 40,368	256,864
Foundries & machine shops	4,500	2,110	.....	8,000
Gloves	500	500	.....	850
Leather manufactures	44,500	39,798	.....	74,499
Lumber	3,700	9,000	.....	22,500
Stone, lime, etc.....	12,000	6,050	.....	17,375
Tanneries	3,500	3,930	.....	8,500
Tailors	5,675	21,000	.....	31,350
Tin ware	10,200	4,143	.....	8,333
Wagon manufactures	31,350	11,606	.....	37,972
Woolen factories	8,000	3,150	<i>c</i> 3,900	4,961
Totals	\$457,625	\$367,900	.....	\$589,632

CRAWFORD.

Agricultural implements ..	\$7,000	\$3,415	.....	\$11,500
Breweries	19,500	4,782	<i>a</i> 1,550	14,250
Brooms	400	208	.....	400
Cabinet ware	7,000	2,800	.....	6,800
Flour mills.....	30,000	61,526	<i>a</i> 9,371	66,377
Leather manufactures	8,200	12,850	.....	20,322
Lumber	44,000	14,707	.....	36,700
Packers	2,500	10,030	.....	13,500
Printing	7,600	4,250	.....	10,400
Soap, etc.....	6,030	7,010	.....	18,000
Tin ware	6,000	4,123	.....	8,200
Wagon manufactures	17,000	9,165	.....	20,685
Woolen mills.....	10,000	4,480	<i>c</i> 10,750	8,125
Totals	\$135,200	\$139,346	.....	\$235,459

a barrels.*b* lumber.*c* yards.

TABLE showing conditions of Manufactures—continued.

DANE.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Agricultural implements ..	\$58,500	\$25,160	.....	\$35,325
Breweries	56,500	37,190	.....	76,940
Book-binding	4,000	4,200	.....	20,000
Building material	23,000	8,750	.....	29,600
Cabinet ware	6,800	6,740	.....	11,558
Cheese	4,100	.....	<i>a</i> 16,048	3,718
Cooperage	2,600	4,600	.....	7,727
Flouring mills	130,000	176,267	<i>b</i> 29,957	223,058
Foundries	7,000	4,870	.....	10,850
Leather manufactures	50,850	46,251	.....	94,240
Tailors	10,750	8,600	.....	15,450
Soda	2,500	3,045	.....	6,000
Vinegar	2,000	5,035	.....	7,000
Tinware	4,000	1,235	.....	3,470
Wagons and carriages	33,000	29,199	.....	43,790
Woolen mills	52,000	20,560	<i>c</i> 44,800	39,200
Totals	\$441,600	\$380,162	.....	\$658,916

DODGE.

Agricultural Implements ..	\$221,625	\$103,855	.....	\$330,175
Bakeries	5,000	2,250	.....	5,350
Blacksmiths	36,200	20,514	.....	82,628
Breweries	59,500	12,180	<i>b</i> 2,715	22,610
Builders	17,725	35,650	.....	85,311
Building material	40,000	12,115	.....	36,573
Cabinet ware	74,500	16,468	.....	49,340
Cheese factories	14,450	.....	<i>a</i> 171,903	25,052
Cooperage	4,845	3,886	.....	7,515
Charcoal	3,000	4,598	.....	8,435
Distilling	2,000	4,625	.....	10,500
Flour mills	240,000	309,504	.....	619,615
Leather manufactures	34,075	27,433	.....	68,785
Lumber	72,000	93,204	.....	127,625
Mining	600,000	45,595	.....	<i>d</i> 85,000
Mineral paint	20,000	2,400	.....	15,000
Soap factory	8,000	6,780	.....	10,000
Stone, lime, etc	13,100	17,200	.....	32,800
Tailors	8,000	4,200	.....	8,000
Tannery	6,800	9,235	.....	15,550
Tin ware	11,000	3,374	.....	6,400
Wagon factory	29,800	21,920	.....	53,310
Wine	3,000	2,000	.....	4,500
Woolen mills	132,500	76,125	<i>c</i> 148,600	151,350
Wool carding	1,000	1,360	.....	1,710
Totals	\$1,663,120	\$833,471	.....	\$1,853,134

a Pounds.*b* barrels.*c* yards.*d* partial.

TABLE showing condition of Manufactures—continued.

DOOR.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Cooperage.....	\$700	.....	.....	\$1,200
Flour mills.....	4,000	.....	.....	40,320
Fisheries.....	16,138	.....	.....	38,924
Lumber.....	389,230	.....	.....	360,766
Nurseries.....	3,000	.....	.....	11,500
Stone, lime, etc.....	800	.....	.....	1,650
Totals.....	\$413,868	.....	.....	\$454,360

DOUGLAS.

Blacksmiths.....	\$300	.....	.....	\$2,500
Breweries.....	5,000	240	<i>a</i> 60	720
Builders.....	1,000	3,800	.....	8,000
Building and other material	9,000	18,000	.....	30,000
Fisheries.....	16,500	15,440	.....	24,900
Leather manufactures....	1,000	3,750	.....	6,050
Lumber.....	20,000	9,000	<i>b</i> 1,500,000	12,300
Tanneries.....	2,750	.....	.....	5,000
Tin ware.....	2,400	2,300	.....	6,700
Totals.....	\$57,950	\$52,230	.....	\$96,170

DUNN.

Blacksmiths.....	\$9,500	\$9,332	.....	\$24,200
Breweries.....	500	275	.....	3,200
Builders.....	3,200	1,850	.....	15,300
Building and other material	16,500	51,380	.....	74,350
Cabinet ware.....	1,000	1,250	.....	15,000
Cooperage.....	1,000	1,550	.....	4,500
Flour mills.....	55,000	120,805	<i>a</i> 2,073	228,800
Foundries and mach. shops	15,000	5,600	.....	33,000
Leather manufactures....	4,200	3,700	.....	9,100
Lumber.....	326,500	211,450	{ <i>c</i> 1,547,000 <i>b</i> 39,200,000 }	634,837
Printing.....	300	.....	.....	3,000
Stone, lime and brick.....	15,000	2,382	.....	5,000
Tailors.....	3,300	7,800	.....	14,000
Tin ware.....	3,500	5,100	.....	11,100
Wagons and carriages.....	3,900	2,275	.....	11,125
Totals.....	\$458,400	\$424,749	.....	\$1,086,512

a barrels.*b* lumber.*c* shingles.

TABLE showing condition of Manufactures—continued.

EAU CLAIRE.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Agricultural implements ..	\$3,300	\$1,100	.....	\$4,400
Blacksmiths.....	8,260	10,572	.....	29,300
Breweries.....	15,000	6,600	a2,200	17,800
Builders.....	250	200	.....	1,000
Building material.....	13,500	12,800	.....	27,800
Cabinet ware.....	3,975	3,700	.....	13,300
Cooperage.....	150	540	.....	1,900
Flour mills.....	45,200	138,600	a27,300	186,005
Foundries and Iron works ..	44,424	9,135	.....	40,500
Leather manufactures	11,000	9,100	.....	27,330
Lumber.....	710,000	328,750	b89,660,000	961,465
Printing.....	3,600	1,100	.....	3,600
Stone, lime and brick	4,000	.....	.....	6,650
Tailors.....	3,300	3,516	.....	8,500
Wagons and carriages.....	3,840	1,360	.....	15,500
Totals	\$227,799	\$527,073	.....	\$1,345,050

FOND DU LAC.

Agricultural implements ..	\$251,400	\$16,250	.....	\$211,000
Breweries.....	4,000	1,450	a450	3,700
Builders.....	3,500	8,700	.....	30,750
Building material.....	584,900	274,344	.....	573,430
Chemicals.....	2,000	4,000	.....	9,000
Cooperage.....	1,300	2,476	.....	9,100
Cabinet ware.....	19,400	6,865	.....	34,420
Cheese.....	26,300	4,000	c441,842	62,819
Cigar manufactures.....	1,000	4,000	.....	8,000
Flouring mills.....	214,942	166,269	a25,700	316,370
Foundries, etc.....	44,000	6,500	.....	37,400
Leather manufactures.....	26,700	30,952	.....	58,321
Lumber.....	530,500	458,620	{ d85,000,000 } { b62,150,000 }	942,900
Matches.....	300	120	.....	600
Oil mills.....	25,000	35,000	e40,000	50,000
Printing.....	8,800	2,355	.....	12,200
Soap and candles.....	3,000	4,000	.....	6,000
Stone, brick, etc.....	12,700	10,365	.....	24,545
Tailors.....	5,500	5,100	.....	10,700
Tanneries.....	20,250	14,000	.....	27,500
Wagon manufactures.....	73,750	37,230	.....	107,710
Wool carding.....	1,200	.....	.....	4,800
Woolen mills.....	20,000	5,000	f15,000	15,000
Totals	\$1,880,442	\$1,093,596	.....	\$2,561,715

a barrels. b lumber. c pounds. d shingles. e gallons. f yards.

TABLE showing condition of Manufactures—continued.

GRANT.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Blacksmiths.....	\$32,900	\$25,233	.....	\$74,400
Breweries.....	32,500	10,240	<i>a</i> 3,050	20,200
Brooms.....	1,500	650	.....	1,500
Building material.....	12,900	10,000	.....	70,000
Cabinet ware.....	9,900	2,370	.....	6,400
Cooperage.....	5,980	6,370	.....	14,962
Flour mills.....	230,000	311,770	<i>a</i> 64,103	397,393
Foundries, etc.....	1,200	.....	.....	5,000
Leather manufactures.....	3,065	12,164	.....	25,770
Lumber.....	22,900	16,135	.....	23,140
Mining, etc.....	99,600	186,984	<i>b</i> 3,751,803	270,447
Powder.....	20,000	4,660	<i>c</i> 10,000	32,000
Stone lime, etc.....	4,750	2,385	.....	9,710
Tannery.....	5,000	3,000	.....	10,000
Tailors.....	4,050	3,210	.....	7,375
Wagon manufactures.....	56,600	10,816	.....	63,200
Woolen factories.....	87,000	35,075	<i>d</i> 64,575	65,478
Wool carding.....	2,000	325	.....	1,000
Totals.....	\$631,845	\$641,387	.....	\$1,095,975

GREEN.

Agricultural implements ..	\$20,000	\$15,000	.....	\$38,000
Blacksmiths.....	16,425	17,027	.....	46,655
Breweries.....	45,000	8,300	<i>a</i> 2,700	26,600
Builders.....	1,450	4,900	.....	11,600
Building materials.....	18,500	7,860	.....	25,800
Cabinet ware.....	10,800	7,800	.....	19,500
Cheese factories.....	11,000	.....	<i>b</i> 35,940	5,377
Cigars.....	3,900	7,800	.....	19,200
Cooperage.....	3,550	12,709	.....	27,870
Flour mills.....	169,000	355,436	.....	440,890
Foundries and mach. shops.	8,000	3,000	.....	7,000
Leather manufactures.....	16,925	33,624	.....	75,470
Lumber.....	53,300	36,000	.....	60,050
Printing.....	5,200	1,500	.....	9,900
Stone lime, etc.....	1,550	4,450	.....	14,600
Tailors.....	6,800	18,600	.....	11,150
Tin ware.....	6,375	17,070	.....	31,400
Wagon manufactures.....	20,800	30,095	.....	21,440
Woolen mills.....	23,000	12,850	.....	107,277
Totals.....	\$441,575	\$594,012	.....	\$999,779

a barrels.*b* pounds.*c* kegs.*d* yards.

TABLE showing condition of Manufactures—continued.

GREEN LAKE.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Agricultural implements ..	\$2,400	\$1,005	.....	\$4,300
Blacksmiths.....	21,600	12,683	.....	36,800
Breweries	11,009	1,760	<i>a</i> 510	4,480
Builders	3,025	.....	.....	17,600
Building material.....	14,090	5,625	.....	12,400
Cabinet ware	9,550	4,970	.....	4,033
Cheese factories	12,200	.....	<i>b</i> 73,000	12,070
Cooperage.....	3,400	11,750	.....	18,765
Flour mills.....	129,800	319,776	<i>a</i> 37,862	60,641
Foundries and mach. shops	14,200	2,651	.....	10,915
Gloves, whips, etc.....	3,000	2,450	.....	4,700
Leather manufactures	18,775	27,171	.....	51,870
Lumber	10,000	8,200	<i>c</i> 1,200,000	18,100
Printing	3,000	1,875	.....	7,700
Stone, lime, brick.....	5,000	3,872	.....	17,978
Tailors.....	11,200	26,150	.....	45,700
Tanneries	1,100	1,525	.....	5,100
Tin Ware	8,000	8,759	.....	19,525
Wagons and carriages.....	25,900	14,397	.....	41,320
Woolen mills.....	39,000	<i>e</i> 25,136	<i>d</i> 15,431	15,692
Totals.....	\$346,150	\$459,755	.....	\$709,689

IOWA.

Agricultural implements ..	\$12,000	\$7,507	.....	\$20,250
Blacksmiths.....	19,950	15,113	.....	36,560
Breweries	45,000	14,715	<i>a</i> 4,366	40,484
Builders	2,140	3,900	.....	24,555
Building material.....	24,000	30,900	.....	71,220
Cabinet ware	8,500	1,875	.....	13,900
Flour mills.....	96,600	116,057	.....	164,252
Foundries, etc.....	25,500	29,263	.....	70,430
Leather manufactures	36,600	56,585	.....	84,702
Mining, etc.....	618,800	225,559	.....	451,959
Printing.....	3,000	1,000	.....	4,400
Stone, lime, etc.....	2,500	750	.....	3,600
Tanneries	500	500	.....	1,350
Tailors.....	11,000	20,000	.....	33,500
Tinsmiths.....	1,850	3,900	.....	7,800
Wagon manufactures	11,100	7,142	.....	21,467
Woolen mills.....	10,000	2,500	.....	4,070
Totals.....	\$929,040	\$540,266	.....	\$1,054,499

a barrels.*b* pounds.*c* lumber.*d* yards.

TABLE showing condition of *Manufactures*—continued.

JACKSON.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Flour mills	\$56,200	\$104,700	<i>a</i> 24,400	\$132,550
Foundries and mach. shops	8,000	3,700	.....	10,000
Lumber	126,000	191,850	<i>d</i> 18,550,100	274,000
Totals	\$190,200	\$300,250	.....	\$416,550

JEFFERSON.

Agricultural implements ..	\$71,400	\$34,232	.....	\$88,740
Artist	2,000	1,000	.....	3,000
Bakeries	15,000	31,675	.....	41,000
Blacksmithing	25,300	12,929	.....	38,972
Breweries	110,000	45,342	<i>a</i> 10,695	74,410
Builders	6,900	12,635	.....	40,650
Building material	62,500	29,550	.....	63,095
Cabinet ware	203,500	107,789	.....	144,170
Candy	500	1,000	.....	2,000
Cheese factories	18,000	.....	<i>b</i> 338,785	40,599
Cigars	15,000	12,850	1,220,000	46,500
Cooperage	9,850	20,572	.....	34,293
Distillery	5,000	1,840	.....	4,750
Flour mills	340,000	915,251	<i>a</i> 183,038	981,580
Foundries, etc	61,500	16,463	.....	42,170
Furriers	3,000	1,500	.....	3,000
Glove factory	2,600	560	.....	1,272
Glue factory	1,800	1,000	.....	2,000
Knitting machines	20,000	2,123	.....	14,500
Leather manufactures	51,550	77,965	.....	169,285
Lumber	42,900	33,925	.....	59,500
Printing	21,500	5,599	.....	20,612
Soda water	5,000	2,880	.....	7,000
Starch	8,000	600	.....	840
Stone, lime, etc	50,750	21,023	.....	81,299
Tanneries	14,000	6,330	.....	10,120
Tailors	13,000	32,768	.....	50,480
Tin smiths	15,000	11,204	.....	23,840
Wagon manufactures	29,000	15,712	.....	41,025
Woolen mills	81,389	22,344	<i>c</i> 39,674	40,010
Totals	1,305,939	1,468,661	.....	\$2,182,532

a barrels.*b* pounds.*c* yards.*d* lumber.

TABLE showing condition of Manufactures—continued.

JUNEAU.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Builders	\$600	\$1,000	.....	\$2,400
Building material	14,000	3,000	.....	9,333
Cabinet ware.....	1,630	1,050	.....	3,262
Cooperage	18,000	6,000	.....	22,300
Flouring mills.....	104,000	108,695	.....	160,927
Leather manufacture	14,900	18,491	.....	34,448
Lumber.....	577,000	21,500	37,075 000	546,510
Printing	4,200	3,025	.....	13,000
Tailors.....	4,385	.....	.....	7,848
Tinsmiths.....	8,385	3,882	.....	15,440
Wagon factory	12,700	4,497	.....	15,980
Totals	\$758,715	\$171,140	.....	\$831,448

KENOSHA.

Agricultural implements ..	\$3,200	\$1,470	.....	\$5,735
Bakeries.....	10,000	16,435	.....	21,576
Breweries.....	162,000	123,714	.....	232,700
Builders	4,100	2,000	.....	12,880
Building material.....	5,000	4,000	.....	10,500
Cabinet ware.....	1,500	1,447	.....	3,011
Cigar manufactory.....	1,600	1,615	.....	3,690
Cheese factory	7,820	.....	<i>a</i> 683,219	.....
Cheese boxes.....	14,000	1,350	.....	4,000
Felt roofing .....	.....	550	.....	700
Fisheries	12,720	675	.....	14,688
Flax factory.....	5,000	4,750	<i>b</i> 350	12,000
Flour mills	30,000	53,250	{ <i>c</i> 10,000 } { <i>d</i> 1,500 }	61,150
Foundries, etc.....	65,000	119,400	.....	196,000
Leather manufacture	38,850	23,428	.....	51,722
Matches	3,000	864	.....	2,640
Pork packers.....	13,000	18,850	<i>b</i> 1,750	26,250
Stone, brick, etc	1,500	1,800	<i>e</i> 700,000	7,000
Tailors	18,800	33,953	.....	51,383
Tanneries	80,500	113,949	.....	168,574
Tinsmiths.....	3,400	3,500	.....	8,652
Wagon factory	121,100	145,607	.....	340,740
Wool carding	1,000	.....	.....	1,710
Totals.....	\$603,090	\$672,607	.....	\$1,237,221

a Pounds. *b* Tons. *c* barrels flour. *d* Tons of feed. *e* Number of brick.

TABLE showing the condition of Manufactures—continued.

KEWAUNEE.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Blacksmiths.....	\$1,300	\$750	.....	\$3,241
Breweries.....	29,000	3,940	<i>a</i> 984	9,840
Cabinet ware.....	5,600	5,050	.....	6,600
Flour mills.....	28,000	72,395	<i>a</i> 14,400	99,000
Leather manufactures.....	8,200	7,985	.....	18,850
Lumber.....	189,365	126,675	16,100,000	191,000
Tailors.....	5,000	6,000	.....	9,000
Tanneries.....	5,000	3,000	.....	5,000
Tin ware.....	200	820	.....	1,800
Wagons and carriages.....	2,600	785	.....	4,031
Totals.....	\$274,265	\$227,400	.....	\$348,362

LA CROSSE.

Agricultural machinery....	\$50,000	\$10,400	.....	\$38,650
Brewers.....	91,000	24,725	<i>a</i> 6,050	70,500
Builders.....	20,000	24,000	.....	135,000
Building and other material	14,000	.....	.....	16,500
Cabinet ware.....	40,000	6,250	.....	37,550
Cheese.....	900	.....	<i>b</i> 14,300	2,002
Flour mills.....	61,500	.....	.....	.....
Gas company.....	70,000	7,100	.....	15,630
Foundries and mach. shops	88,500	47,795	.....	142,800
Leather manufactures.....	27,150	.....	.....	53,825
Lumber.....	414,000	154,900	{ <i>c</i> 17,500,000 <i>d</i> 16,250,000 <i>e</i> 4,000,000 }	306,250
Packet company.....	10,000	45,000	.....	135,000
Photographers.....	1,600	1,305	.....	8,800
Printers.....	81,000	14,075	.....	77,300
Tailors.....	17,000	29,650	.....	57,935
Wagon manufactures.....	8,300	11,040	.....	19,700
Totals.....	\$984,950	\$376,240	.....	\$817,442

a barrels.*b* pounds.*c* lumber.*d* shingles.*e* lath.

TABLE showing condition of Manufactures—continued.

LA FAYETTE.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Blacksmiths.....	\$8,150	\$12,790	.....	\$28,595
Breweries.....	11,000	5,280	<i>a</i> 1,260	10,205
Brooms.....	400	3,000	.....	5,300
Builders.....	3,050	13,600	.....	30,700
Building material.....	2,500	7,150	.....	8,300
Cabinet ware.....	3,500	1,475	.....	6,800
Cheese factories.....	1,600	.....	<i>b</i> 6,000	960
Cigars.....	500	1,500	.....	3,000
Flour mills.....	117,000	188,340	<i>a</i> 20,170	238,035
Flax.....	10,000	1,250	<i>c</i> 450	27,000
Leather manufactures.....	8,000	16,810	.....	30,115
Lumber.....	3,000	2,200	.....	4,400
Mining.....	40,250	123,989	<i>b</i> 6,563,280	297,556
Stone, lime.....	1,800	1,650	.....	5,300
Tanneries.....	1,000	325	.....	500
Tinsmiths.....	3,250	4,500	.....	16,300
Wagon factories.....	7,950	13,970	.....	32,950
Totals.....	\$222,950	\$397,829	.....	\$746,016

MANITOWOC.

Blacksmiths.....	\$2,400	\$1,450	.....	\$3,010
Breweries.....	40,300	14,440	<i>a</i> 3,793	32,962
Building Material.....	7,000	5,800	.....	16,480
Cabinet ware.....	44,800	12,737	.....	54,543
Cigars.....	850	2,575	.....	3,400
Cooperage.....	38,000	38,959	.....	79,973
Flour mills.....	169,100	247,310	<i>a</i> 53,759	284,426
Fisheries.....	5,700	800	.....	14,100
Foundries, etc.....	8,000	2,295	.....	21,100
Leather manufactures.....	12,606	16,471	.....	30,165
Lumber.....	244,800	138,945	.....	274,175
Potash.....	4,000	4,200	.....	8,800
Tanneries.....	81,500	173,834	.....	272,969
Wagons.....	13,700	4,189	.....	18,060
Woolen factory.....	40,000	14,000	.....	26,000
Wool carding.....	4,500	12,000	.....	14,150
Totals.....	\$717,256	\$690,005	.....	\$1,154,304

a barrels.*b* pounds.*c* tons.

TABLE showing condition of Manufactures—continued.

MARATHON.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Blacksmiths.....	\$500	\$560	.....	\$2,000
Breweries.....	22,000	2,320	<i>a</i> 805	8,700
Builders.....	1,500	3,350	.....	22,200
Cabinet ware.....	.....	.....	.....	2,500
Flour mills.....	6,000	26,000	<i>a</i> 4,700	27,100
Leather manufactures.....	1,550	4,730	.....	8,810
Lumber.....	346,000	286,000	<i>b</i> 57,760,000 <i>c</i> 6,300,000	603,500
Stone, lime, etc.....	200	200	.....	800
Tailors.....	2,500	5,000	.....	9,800
Tanneries.....	3,200	2,400	.....	2,850
Tin ware.....	1,800	1,800	.....	5,500
Wagons and carriages.....	700	1,375	.....	2,700
Totals.....	\$385,950	\$334,635	.....	696,460

MARQUETTE.

Agricultural implements..	\$2,000	\$3,260	.....	\$9,484
Blacksmiths.....	1,600	2,950	.....	7,050
Builders.....	500	225	.....	1,700
Cooperage.....	500	400	.....	1,050
Flour mills.....	71,400	82,494	<i>a</i> 3,000	109,813
Leather manufactures.....	1,900	3,515	.....	7,212
Lumber.....	5,500	7,510	<i>b</i> 850,000	12,950
Printing.....	1,500	400	.....	700
Wagons and carriages.....	2,450	2,175	.....	5,000
Wool carding.....	.....	3,328	.....	8,588
Woolen Mills.....	21,000	4,244	<i>d</i> 8,982	8,447
Totals.....	\$107,350	\$110,501	.....	\$171,984

MILWAUKEE.

Agricultural implements..	<i>a</i> 38,950	\$17,070	.....	\$64,700
Artificial limbs.....	300	.....	.....	2,250
Bag factory.....	500	3,000	.....	4,000
Bakeries.....	60,650	117,485	.....	196,851
Baskets.....	800	200	.....	800
Bitters.....	16,000	15,000	.....	52,500
Billiard tables.....	20,000	24,600	.....	64,000
Blacksmiths.....	27,950	29,415	.....	82,031
Breweries.....	769,600	455,838	<i>a</i> 108,845	1,088,450
Brooms.....	6,250	19,944	.....	42,545
Brushes.....	2,500	2,000	.....	2,600
Builders.....	46,850	147,250	.....	367,750
Building material.....	391,993	290,455	.....	621,897
Cabinet ware.....	316,750	189,605	.....	523,874
Carving.....	3,400	6,280	.....	10,000

a barrels.*b* lumber.*c* shingles.*d* yards.

TABLE showing condition of Manufactures—continued.

MILWAUKEE—continued.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Carpets	\$10,200	\$2,425	.....	\$18,200
Chemical manufactures ...	5,000	6,000	.....	16,000
Cigars	269,150	173,823	.....	778,350
Coffee and spice mills.....	91,360	87,100	.....	109,659
Confectionary	41,000	59,888	.....	101,000
Cooperage.....	46,640	92,352	.....	183,417
Curled hair etc.....	10,000	27,932	.....	52,260
Dentists	8,800	.....	.....	52,000
Distilleries	651,000	1,117,100	.....	2,253,290
Drugs	3,000	2,500	.....	16,500
Engravers and lithograph's	19,000	6,000	.....	41,000
Files	2,500	1,500	.....	8,000
Fisheries.....	1,900	400	.....	3,250
Flour mills.....	528,500	2,907,491	a668,974	3,853,793
Foundries and iron works..	552,200	469,022	.....	1,113,437
Gas works.....	570,500	49,913	.....	199,710
Gas fitters.....	75,000	90,000	.....	190,000
Gloves	2,000	600	.....	1,800
Gunsmiths	4,000	3,700	.....	9,100
Hats and caps.....	13,100	2,800	.....	6,000
Hair work.....	22,000	.....	.....	19,000
Jewelry	2,500	.....	.....	4,000
Lead pipe.....	2,000	.....	.....	4,000
Leather manufactures.....	538,182	440,376	.....	1,034,642
Lumber	63,500	54,000	.....	58,000
Matches	30,000	79,500	.....	99,000
Millinery.....	21,050	15,500	.....	78,850
Mineral water	15,000	8,400	.....	19,440
Organ factories	15,000	10,000	.....	25,000
Paint	25,000	28,000	.....	34,000
Painters	13,100	15,206	.....	121,675
Photographers.....	25,200	20,400	.....	43,800
Potash	2,000	4,500	.....	7,920
Printing	925,750	291,450	.....	433,000
Plaster.....	2,000	10,100	.....	12,000
Rope factory.....	3,100	3,450	.....	5,500
Safes	45,000	12,000	.....	50,000
Sail makers	27,000	32,000	.....	50,000
Soap and candles	68,700	113,891	.....	213,924
Ship builders.....	40,000	60,000	.....	125,000
Soda water.....	9,000	9,770	.....	16,000
Stone and earthen ware ...	20,250	7,239	.....	27,150
Stone, lime and brick	320,230	125,484	.....	408,692
Tailors.....	719,430	789,762	.....	1,507,462
Tanneries	380,600	692,752	.....	836,723
Tiles and pipe.....	15,000	7,200	.....	16,900
Tin and hollow ware	89,664	71,627	.....	287,400
Tobacco.....	265,000	286,000	.....	938,000
Type foundry.....	25,000	1,650	.....	11,000
Vinegar.....	13,000	37,600	.....	53,700
Wagons and carriages.....	70,750	71,050	.....	197,827
Willow ware	56,000	10,000	.....	72,000
Wire, screens, etc.....	700	500	.....	2,000
Woolen factories.....	24,500	17,617	{ b5,982 c16,600 }	{ 27,407 }
Totals	8,501,849	9,765,717	.....	18,972,026

a barrels.

b yards..

c pounds of yarn.

TABLE showing the condition of Manufactures—continued.

MONROE.

BUSINESS.	Capital.	Value of material	Product.	Value of product.
Agricultural implements ..	\$1,300	\$970	.....	\$4,150
Blacksmithing.....	18,125	13,365	.....	32,935
Breweries.....	10,000	3,150	a650	7,800
Brooms.....	5,000	1,931	.....	3,182
Building material.....	12,900	5,600	.....	18,169
Cabinet ware.....	1,600	110	.....	2,198
Cheese factories.....	3,782	.....	b44,680	6,255
Cooperage.....	7,200	17,428	.....	26,818
Flour mills.....	161,000	279,125	a68,485	374,732
Gloves.....	1,600	1,800	.....	6,710
Foundries.....	4,000	4,095	.....	7,650
Leather manufactures.....	16,275	14,706	.....	31,132
Lumber.....	90,600	72,945	.....	180,740
Medicines.....	6,000	4,430	.....	8,150
Paper.....	50,000	10,020	.....	11,100
Printing.....	4,000	606	.....	1,950
Stone, lime, etc.....	7,175	2,655	.....	14,825
Tanneries.....	6,150	3,747	.....	8,571
Tailors.....	6,500	5,660	.....	21,214
Tinsmiths.....	6,500	9,786	.....	13,505
Wagons.....	7,300	1,827	.....	11,624
Woolen mills.....	24,000	11,600	.....	16,750
Totals.....	\$451,007	\$465,556	.....	\$813,160

OCONTO.

Breweries.....	\$9,000	\$4,900	a1,125 ^a	\$11,250
Building materials.....	13,000	3,490	.....	69,100
Cooperage.....	550	955	.....	3,200
Fisheries.....	17,300	12,702	.....	42,281
Flour mills.....	5,000	11,750	a1,800	13,000
Foundries and mach. shops	16,000	7,550	.....	21,200
Leather manufactures.....	6,750	7,289	.....	20,275
Lumber.....	1,666,000	912,850	{ c32,660,000 d94,950,000 }	{ 1,741,160
Wagons and carriages.....	1,800	4,150	.....	5,720
Totals.....	\$1,735,400	\$965,636	.....	\$1,927,186

OUTAGAMIE.

Blacksmithing.....	\$6,600	\$950	.....	\$10,300
Breweries.....	18,000	660	a230	2,740
Building material.....	82,000	84,200	.....	359,270
Cabinet ware.....	7,500	9,450	.....	30,000
Cheese factories.....	1,200	.....	b4,450	712
Cooperage.....	50,000	22,000	.....	56,000
Flour mills.....	123,000	292,050	a66,100	309,168

a barrels.

b pounds.

c shingles.

d lumber.

TABLE showing condition of *Manufactures*—continued.

OUTAGAMIE—continued.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Foundries, etc.....	\$20,000	\$6,120	.....	\$26,150
Leather manufactures.....	9,000	14,000	.....	32,000
Lumber.....	151,000	77,244	.....	266,442
Paper mills.....	25,000	9,100	.....	19,000
Tanneries.....	35,000	43,800	.....	56,300
Tinsmiths.....	4,140	1,052	.....	4,300
Woolen factories.....	80,000	40,000	.....	90,000
Totals.....	\$612,440	\$600,626	.....	\$1,262,382

OZAUKEE.

Blacksmiths.....	\$11,500	\$12,770	.....	\$25,781
Breweries.....	53,200	18,423	<i>a</i> 4,689	38,983
Builders.....	3,300	12,800	.....	23,100
Cabinet ware.....	23,000	6,450	.....	27,950
Cigars.....	500	700	.....	1,900
Cooperage.....	5,900	4,250	.....	10,725
Flour mills.....	151,000	405,750	<i>a</i> 87,857	447,896
Foundries.....	6,500	2,550	.....	3,725
Leather manufactures.....	11,150	12,126	.....	24,013
Lumber.....	17,500	4,355	.....	8,805
Soda water.....	2,000	2,850	.....	5,250
Tanneries.....	7,400	6,311	.....	14,341
Tailors.....	2,250	3,300	.....	5,800
Tinsmiths.....	3,900	3,620	.....	7,250
Wagons.....	15,875	3,860	.....	10,935
Woolen mills.....	65,000	30,220	.....	49,594
Totals.....	\$379,975	\$530,335	.....	\$706,048

PEPIN.

Blacksmiths.....	\$850	\$1,000	.....	\$2,500
Breweries.....	9,000	1,900	<i>a</i> 200	2,000
Building materials.....	2,000	970	.....	2,400
Cabinet ware.....	1,300	1,630	.....	3,225
Cooperage.....	500	500	.....	1,200
Flour mills.....	18,000	24,405	<i>a</i> 4,250	31,170
Foundries and mach. shops.	2,000	380	.....	1,300
Leather manufactures.....	500	1,030	.....	3,000
Lumber.....	132,500	7,705	<i>b</i> 7,975,000	126,620
Stone lime, etc.	2,700	820	.....	5,400
Tinware.....	900	1,500	.....	2,400
Wagons, carriages.....	800	800	.....	1,500
Wool carding.....	4,000	.....	.....	800
Totals.....	\$175,050	\$42,640	.....	\$183,515

a barrels.*b* feet.

TABLE showing condition of Manufactures—continued.

PIERCE.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Blacksmiths.....	\$7,800	\$8,945	.....	\$14,650
Breweries.....	10,000	2,875	.....	2,800
Building material.....	15,300	13,600	.....	24,900
Cabinet ware.....	4,000	.....	.....	5,425
Cooperage.....	1,000	500	.....	2,000
Flour mills.....	89,800	71,700	.....	90,000
Foundries and iron works..	1,600	2,000	.....	3,500
Leather manufactures.....	8,200	7,804	.....	16,200
Lumber.....	88,500	46,250	2,900,000	134,600
Tailors.....	1,600	950	.....	2,300
Tin ware.....	2,000	1,000	.....	2,000
Wagons and carriages.....	7,650	4,324	.....	21,000
Wool carding.....	500	100	.....	500
Totals.....	\$237,950	\$160,048	.....	\$318,875

POLK.

Blacksmiths.....	400	900	.....	1,565
Builders.....	1,200	1,000	.....	2,500
Cabinet ware.....	1,000	1,100	.....	1,975
Flour mills.....	19,000	22,840	a 6,960	35,300
Leather manufacture.....	300	500	.....	1,050
Lumber.....	16,000	7,600	6,450,000	63,025
Totals.....	\$37,900	\$33,940	.....	\$105,415

PORTAGE.

Agricultural implements...	1,000	500	.....	1,000
Blacksmiths.....	9,300	5,454	.....	19,985
Breweries.....	7,500	2,965	a 570	5,700
Building material.....	4,500	4,975	.....	5,400
Cabinet ware.....	2,500	300	.....	2,015
Cooperage.....	2,000	710	.....	1,950
Flour mills.....	52,500	97,967	{ b 21,594 } { c 22,557 }	124,800
Foundries.....	1,600	1,610	.....	5,100
Leather manufactures.....	2,225	1,750	.....	3,715
Lumber.....	342,270	171,579	.....	316,689
Tanneries.....	2,000	1,600	.....	11,200
Tinsmiths.....	4,200	3,180	.....	5,400
Wagon manufactories.....	2,600	805	.....	5,695
Totals.....	\$434,395	\$293,395	.....	\$508,649

a barrels.

b tons feed.

c flour.

TABLE showing condition of Manufactures—continued.

RACINE.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Agricultural implements ..	\$570,900	\$462,120	.....	\$1,340,000
Blacksmiths	12,600	5,600	.....	19,925
Breweries	47,000	29,649	<i>a</i> 5,530	55,300
Baskets	12,000	5,050	.....	100,000
Builders	8,125	8,250	.....	19,125
Building material.....	78,000	158,912	.....	275,050
Cabinet ware	28,700	8,530	.....	33,420
Cigars	10,400	4,635	.....	18,600
Confectionary	3,500	9,150	.....	14,000
Cooperage.....	6,650	9,830	.....	91,000
Flour mills.....	215,000	377,056	{ <i>b</i> 2,275 <i>c</i> 55,884 }	{ 474,828 }
Fisheries.....	1,000	880	.....	1,500
Furriers.....	3,000	2,500	.....	4,800
Foundries and iron works..	26,000	32,430	.....	46,000
Gas works.....	15,000	2,925	.....	13,503
Leather manufactures	72,400	92,415	.....	179,961
Lumber	400,000	.....	.....	<i>e</i> 25,000
Peat manufactory	10,000	50	.....	750
Pork packers	61,100	139,224	.....	165,286
Pressing hay	3,000	6,930	.....	8,976
Printing, etc.....	32,700	14,835	.....	40,200
Soap and candles, etc.....	11,000	13,180	.....	17,861
Stone, lime, bricks, etc.....	133,000	67,905	.....	131,805
Rope factory.....	6,000	7,470	.....	7,000
Tailors	69,900	46,537	.....	78,650
Tanneries	70,800	138,209	.....	325,560
Tin ware	20,300	14,695	.....	34,051
Vinegar	3,900	5,269	.....	11,000
Wagon and carriages	247,100	174,321	<i>d</i> 8,000	830,000
Woolen mills.....	125,000	48,954	.....	90,000
Totals	\$2,317,075	\$1,887,511	.....	\$4,453,151

RICHLAND.

Blacksmiths.....	\$1,725	\$1,415	.....	\$4,325
Builders	1,800	3,580	.....	4,020
Cabinet ware	19,500	5,000	.....	15,500
Cheese factory.....	1,500	.....	<i>f</i> 15,000	1,900
Cooperage.....	405	688	.....	3,217
Flour mills.....	89,400	119,898	<i>a</i> 31,925	167,273
Leather manufactures.....	4,150	12,970	.....	19,595
Lumber	33,200	19,435	.....	40,675
Tanneries	5,500	3,705	.....	7,200
Tin ware	1,800	7,100	.....	10,600
Wagon factories	3,200	4,380	.....	9,965
Woolen factories	5,000	3,530	.....	6,700
Wool carding.....	1,500	1,700	.....	1,975
Totals	\$168,680	\$183,401	.....	\$292,945

a barrels. *b* feed. *c* flour. *d* wagons. *e* partial returns. *f* pounds.

TABLE showing condition of Manufactures—continued.

ROCK.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Agricultural implements ..	\$251,500	\$101,915	.....	\$337,100
Blacksmiths.....	19,300	17,253	.....	51,460
Breweries.....	87,500	18,730	a5,100	52,200
Brooms.....	1,150	4,300	.....	8,625
Builders.....	28,775	66,920	.....	157,170
Building material.....	47,000	23,360	.....	45,722
Cabinet ware.....	37,600	14,900	.....	23,700
Cheese factories.....	15,500	.....	c189,901	28,804
Cigar manufactures.....	9,700	14,282	.....	29,700
Cooperage.....	19,900	28,189	.....	46,906
Distillers.....	13,500	5,835	.....	27,752
Flour mills.....	556,500	1,167,532	.....	1,319,151
Gas works.....	75,000	5,790	.....	21,424
Foundries.....	118,700	43,302	.....	148,213
Leather manufactures.....	44,950	62,869	.....	142,847
Oil mills.....	2,000	1,070	.....	1,800
Paper.....	260,000	95,277	.....	193,500
Printing.....	36,700	8,254	.....	40,082
Perfumery.....	25,000	45,000	.....	60,000
Soap, potash, etc.....	700	1,311	.....	65,500
Stone, lime etc.....	64,760	106,451	.....	195,217
Tailors.....	35,100	31,214	.....	52,757
Tin ware.....	14,100	11,046	.....	24,103
Wagon manufactures.....	61,350	41,135	.....	114,888
Woolen mills.....	108,000	48,445	.....	88,450
Totals.....	\$1,894,285	\$1,964,380	.....	\$3,277,071

SAUK.

Blacksmiths.....	\$17,800	\$16,535	.....	\$35,526
Breweries.....	22,800	11,444	a2,686	26,400
Builders.....	3,900	19,225	.....	34,450
Building material.....	17,000	23,600	.....	37,670
Cabinet ware.....	57,000	14,260	.....	49,700
Charcoal.....	1,700	1,825	.....	4,921
Cheese.....	3,070	.....	b49,494	7,920
Cigars.....	400	400	.....	800
Cooperage.....	11,600	7,200	.....	14,450
Flouring mills.....	126,300	120,800	.....	130,049
Foundries and mach. shops	21,000	9,592	.....	29,900
Leather manufactures.....	21,800	19,584	.....	37,715
Lumber.....	40,300	19,255	.....	38,980
Mining and smelting.....	50,000	21,480	c1,600	42,700
Printing.....	800	400	.....	2,500
Soda water.....	2,500	1,000	.....	3,500

a barrels.

b pounds.

c tons of iron.

TABLE showing condition of *Manufactures*—continued.

SAUK—continued.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Stone lime, etc.	\$1,300	\$650	.....	\$3,500
Tailors.....	6,100	8,550	.....	13,300
Tin ware.....	6,800	3,928	.....	9,700
Wagons and carriages.....	6,500	3,050	.....	8,520
Woolen mills.....	70,000	55,800	<i>a</i> 99,000	108,300
Totals	\$488,670	\$368,578	.....	\$640,501

SHAWANO.

Blacksmiths.....	\$2,300	\$850	.....	\$2,350
Flour mills.....	13,000	17,535	<i>b</i> 2,625	21,200
Leather manufactures.....	1,500	1,902	.....	2,985
Lumber.....	44,000	14,913	<i>c</i> 3,025,000	60,700
Totals	\$60,800	\$35,200	.....	\$87,235

ST. CROIX.

Agricultural implements ..	\$5,800	\$6,200	.....	\$27,095
Blacksmiths	13,000	7,325	.....	24,432
Breweries	4,000	1,790	<i>b</i> 1,300	12,000
Builders	24,700	28,755	.....	63,637
Building material.....	4,000	2,925	.....	3,650
Cabinet ware.....	2,000	1,525	.....	3,450
Cooperage.....	2,500	375	.....	860
Flour mills.....	132,000	203,012	.....	241,111
Leather manufactures.....	19,700	3,749	.....	12,705
Lumber	116,500	98,600	.....	185,390
Printing	8,000	2,650	.....	13,196
Tailors....	4,000	2,000	.....	11,332
Tinsmiths	6,300	5,780	.....	11,975
Wagon shops.....	1,800	995	.....	3,720
Totals	\$344,300	\$185,681	.....	\$614,553

a yards.*b* barrels.*c* feet.

TABLE showing condition of *Manufactures*—continued.

SHEBOYGAN.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Agricultural implements ..	\$19,350	\$9,731	.....	\$46,340
Breweries	70,300	35,174	a9,607	89,501
Building and other material	43,000	20,000	.....	46,140
Cabinet ware	62,400	37,599	.....	212,335
Cheese factories	12,500	.....	b87,030	17,782
Cigars	4,500	3,500	.....	10,450
Cooperage.....	5,900	6,300	.....	24,580
Fisheries.....	19,275	6,575	.....	33,912
Flour mills.....	184,900	261,873	a86,212	394,984
Foundries, etc.....	70,500	62,411	.....	135,475
Glue factory.....	800	115	.....	705
Leather manufactures	38,890	34,293	.....	65,686
Lumber	72,500	40,366	c500,000	74,204
Nurseries	5,500	.....	.....	37,000
Oil mills	4,700	1,675	.....	2,450
Packers	3,800	3,145	.....	5,064
Plaster.....	15,000	7,000	.....	10,500
Pottery	10,000	4,171	.....	5,800
Printing.....	9,200	2,750	.....	15,350
Refineries	8,000	26,800	.....	30,300
Soda water and pop	5,000	930	.....	2,100
Sail makers	1,000	5,650	.....	6,900
Stone, brick, etc.....	25,000	12,780	.....	40,350
Tailors.....	36,800	27,608	.....	44,081
Tanneries.....	62,700	59,125	.....	99,950
Wagons and carriages.....	19,850	34,221	.....	50,355
Woolen mills.....	45,000	28,750	.....	67,000
Totals.....	\$856,365	\$732,542	.....	\$1,336,994

TREMPEALEAU.

Agricultural implements ..	\$1,000	\$1,200	.....	\$2,400
Blacksmiths.....	2,400	3,580	.....	8,250
Builders	1,900	11,645	.....	23,680
Building material.....	9,500	650	.....	4,500
Cooperage.....	1,000	500	.....	1,200
Flour mills.....	8,000	71,637	a1,200	57,994
Leather manufactures	4,250	7,550	.....	13,000
Lumber	4,000	3,250	.....	6,500
Stone, lime and brick	900	.....	.....	2,400
Tailors.....	500	2,000	.....	3,000
Tin ware.....	2,500	1,500	.....	,300
Wagons and carriages.....	1,800	1,100	.....	,100
Totals.....	\$37,750	\$104,612	.....	\$129,324

a barrels.

b pounds.

c feet.

TABLE showing condition of *Manufactures*—continued.

VERNON.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Blacksmiths.....	\$6, 150	\$9, 432	.....	\$20, 440
Breweries.....	2, 900	850	<i>a</i> 290	2, 900
Builders.....	300	400	.....	900
Cabinet ware.....	2, 000	305	.....	1, 500
Cooperage.....	300	150	.....	550
Flour mills.....	105, 500	225, 255	<i>a</i> 41, 120	253, 337
Leather manufactures.....	2, 050	3, 300	.....	8, 100
Lumber.....	71, 800	78, 280	<i>b</i> 5.442, 000	104, 200
Tin ware.....	500	300	.....	950
Wagons and carriages.....	3, 350	2, 680	.....	11, 000
Wool carding.....	1, 400	4, 480	.....	7.150
Totals.....	\$196, 250	\$324, 432	.....	\$411, 027

WALWORTH.

Agricultural implements ..	\$152, 000	\$56, 525	.....	\$202, 835
Blacksmiths.....	12, 000	8, 567	.....	25, 500
Baskets.....	1, 000	350	.....	2, 100
Bitters.....	400	216	.....	1, 100
Breweries.....	10, 000	3, 900	<i>a</i> 800	9, 400
Brooms.....	6, 800	7, 044	.....	11, 466
Builders.....	2, 190	3, 650	.....	17, 050
Building material.....	10, 000	4, 000	.....	12, 000
Cabinet ware.....	16, 500	2, 730	.....	8, 500
Cheese factories.....	14, 500	.....	<i>c</i> 208, 235	28, 270
Cooperage.....	2, 800	4, 280	.....	5, 700
Earthen ware.....	5, 000	650	.....	6, 500
Flour mills.....	228, 500	329, 317	<i>a</i> 980	400, 501
Leather manufactures.....	33, 400	30, 465	.....	67, 143
Lumber.....	6, 000	620	.....	1, 320
Paper.....	50, 000	7, 460	.....	20, 850
Printing.....	5, 600	1, 200	.....	4, 000
Stone, lime, etc.....	21, 300	6, 430	.....	18, 030
Tanneries.....	1, 000	450	.....	700
Tailors.....	16, 600	18, 200	.....	30, 600
Tin ware.....	8, 100	7, 749	.....	16, 100
Vinegar.....	2, 500	960	.....	4, 000
Wagon factories.....	75, 300	93, 515	.....	241, 112
Totals.....	\$541, 490	\$598, 278	.....	\$1, 134, 777

a barrels.*b* feet.*c* pounds.

TABLE showing condition of Manufactures—continued.

WASHINGTON.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Agricultural implements...	\$9,800	\$4,510	.....	\$13,500
Blacksmiths.....	30,865	18,116	.....	42,215
Breweries.....	48,100	17,395	<i>a</i> 3,310	35,345
Builders.....	725	2,700	.....	6,000
Building materials.....	16,500	9,800	.....	28,400
Cabinet ware.....	13,650	4,000	.....	13,500
Cigars.....	100	245	.....	700
Cooperage.....	4,100	3,828	.....	11,125
Flour mills.....	161,000	437,810	<i>a</i> 90,430	476,320
Foundries and iron works..	3,000	830	.....	4,900
Gloves.....	4,200	4,325	.....	6,062
Leather manufactures.....	30,750	27,325	.....	47,426
Lumber.....	44,700	32,655	<i>b</i> 3,720,000	297,085
Printing.....	3,000	545	.....	3,100
Pottery.....	300	.....	.....	600
Soda water.....	5,000	1,100	.....	2,400
Stone, lime and brick.....	5,550	880	.....	8,110
Tailors.....	9,800	17,922	.....	29,880
Tanneries.....	5,150	6,050	.....	8,236
Tin ware.....	7,800	3,785	.....	6,566
Wagons and carriages.....	15,350	3,900	.....	14,220
Weaving.....	200	.....	.....	1,160
Woolen mills.....	26,000	2,020	.....	3,000
Totals.....	\$445,640	\$599,741	.....	\$1,059,850

WAUKESHA.

Agricultural implements ..	\$35,400	\$13,520	.....	\$34,608
Basket factory.....	390	380	.....	1,000
Blacksmiths.....	38,575	15,223	.....	59,890
Breweries.....	25,500	6,440	<i>a</i> 1,810	16,530
Brooms.....	1,500	1,260	.....	2,300
Builders.....	12,765	8,525	.....	28,469
Building material.....	8,700	2,720	.....	6,400
Cabinet ware.....	4,900	1,795	.....	5,925
Coopers.....	7,650	5,475	.....	18,080
Drugs.....	400	250	.....	500
Flour mills.....	246,000	392,848	<i>a</i> 68,723	450,146
Foundries and iron works..	13,500	9,201	.....	13,600
Leather manufactures.	22,500	16,898	.....	40,487
Lumber.....	38,200	17,695	.....	36,040
Printing.....	1,200	440	.....	2,500
Stone, brick, etc.....	50,000	16,988	.....	55,360
Tailors.....	10,950	19,025	.....	33,450
Tin ware.....	3,900	5,404	.....	10,820
Wagons and carriages.....	13,850	5,403	.....	25,800
Weaving.....	400	.....	.....	1,949
Wool carding.....	2,000	3,000	.....	3,700
Woolen factories.....	63,200	16,730	{ <i>d</i> 3,200 } { <i>c</i> 29,375 }	37,237
Totals.....	\$601,480	\$559,220	.....	\$882,791

a barrels.*b* feet.*c* pounds yarn.*d* yards cloth.

TABLE showing condition of *Manufactures*—continued.

WAUPACA.

BUSINESS.	Capital.	Value of Material.	Product.	Value of Product.
Agricultural implements ..	\$2,500	\$610	.....	\$2,800
Blacksmiths.....	7,400	5,100	.....	12,000
Builders	2,650	6,300	.....	12,900
Building material.....	55,600	13,000	.....	46,285
Cabinet ware	5,500	1,120	.....	6,600
Cigars	600	1,500	.....	2,000
Flour mills.....	93,000	196,104	<i>a</i> 28,650	192,478
Foundries and iron works..	7,500	7,089	.....	16,420
Leather manufactures.....	13,875	12,700	.....	27,700
Lumber	111,000	69,371	13,288,000	104,175
Stone, lime and brick	600	150	.....	1,190
Tanneries	42,300	54,900	.....	91,954
Wagons and carriages.....	9,550	4,950	.....	13,040
Woolen factories	30,000	13,100	<i>b</i> 26,000	23,600
Totals	\$382,075	\$385,994	.....	\$553,142

WAUSHARA.

Blacksmiths.....	\$5,650	\$3,112	.....	\$175,000
Building material.....	300	200	.....	750
Cabinet ware.....	1,450	700	.....	2,550
Cooperage.....	150	200	.....	1,000
Flouring mills.....	62,500	58,720	<i>a</i> 16,904	165,914
Gloves and mittens.....	500	400	.....	1,000
Leather manufactures.....	1,900	2,400	.....	5,250
Lumber	48,800	29,158	7,850,000	69,514
Pottery	1,000	400	.....	3,000
Tailors.....	1,000	1,450	.....	2,900
Tinware.....	500	1,900	.....	3,400
Wagons and carriages.....	2,300	1,835	.....	4,770
Totals	\$126,050	\$100,475	.....	\$277,548

WINNEBAGO.

Agricultural implements ..	\$1,000	\$1,550	.....	\$5,800
Blacksmiths.....	32,300	15,657	.....	44,714
Breweries	49,500	15,740	<i>a</i> 4,176	32,014
Building and other material	324,050	322,995	.....	483,760
Cabinet ware	36,750	11,376	.....	44,030
Cigars	1,500	1,500	.....	3,500
Cooperage.....	125,000	113,555	.....	214,826
Flour mills.....	325,000	1,332,215	{ <i>c</i> 274,775 } { <i>d</i> 6,503 }	1,352,531
Gas.....	40,000	2,331	.....	13,450
Gloves	400	860	.....	2,510
Foundries.....	89,200	33,029	.....	94,240
<div style="display: flex; justify-content: space-around; margin-top: 10px;"> <i>a</i> barrels. <i>b</i> yards. <i>c</i> tons. </div>				

TABLE showing condition of *Manufactures*—continued.

WINNEBAGO—continued.

BUSINESS.	Capital.	Value of material.	Product.	Value of product.
Leather manufactures	\$44,250	\$47,826	.....	\$106,951
Lumber	1,475,000	1,201,236	.....	1,967,151
Matches	16,500	28,789	.....	63,232
Medicines	7,000	5,000	.....	31,600
Paper	60,000	97,000	.....	125,750
Potash	2,000	1,050	.....	1,700
Pottery	3,000	1,436	.....	4,500
Stone, lime, etc	60,100	16,510	.....	63,842
Tanneries	45,000	22,880	.....	22,890
Tailors	7,400	17,675	.....	22,875
Tallow chandlers	6,000	6,320	.....	11,200
Tinsmiths	13,500	12,181	.....	25,150
Tobacconists	1,000	1,200	.....	3,550
Vinegar	3,000	1,200	.....	4,000
Wagon factories	38,200	13,266	.....	50,605
Woolen factories	45,500	34,600	.....	64,300
Totals	\$2,852,150	\$3,358,977	.....	\$4,860,671

WOOD.

Blacksmiths	\$2,800	\$2,565	.....	\$5,500
Breweries	3,500	1,275	<i>a</i> 410	4,100
Builders	2,100	4,875	.....	13,815
Cabinet ware	2,200	360	.....	4,000
Flour mills	10,000	8,800	<i>a</i> 1,000	9,600
Foundries and mach. shops	8,500	8,000	.....	17,852
Leather manufactures	1,800	1,320	.....	5,478
Lumber	427,100	166,125	{ <i>b</i> 25,650 <i>c</i> 342,500 }	420,250
Tailors	2,000	1,365	.....	2,400
Tin ware	2,000	3,730	.....	8,000
Wagons, carriages	1,750	750	.....	3,705
Totals	\$463,750	\$199,165	.....	\$494,700

a barrels. *b* lumber. *c* shingles.

"C."

TABLE showing the Agricultural and Manufacturing Productions of the State by Counties, during the year ending June 1, 1870, compiled from the United States census for 1870.

COUNTIES.	IMPROVED LANDS.	WHEAT.	RYE.	CORN.	OATS.
	No. Acres.	Bushels.	Bushels.	Bushels.	Bushels.
Adams.....	42,913	121,010	52,932	129,469	80,276
Ashland	175	.....	.....	.....	350
Barron.....	384	1,655	600	965	10,130
Bayfield	5	.....	.....	.....	.....
Brown	51,192	156,783	16,819	14,967	155,301
Buffalo	58,016	565,625	11,544	194,292	307,183
Burnett.....	1,164	2,493	.....	545	1,349
Calumet	62,058	332,107	2,102	41,232	167,786
Chippewa.....	16,423	81,092	1,792	9,930	126,693
Clark.....	8,143	8,159	559	11,007	33,019
Columbia	251,260	1,529,562	42,176	530,767	693,465
Crawford.....	55,684	182,420	1,004	265,045	161,268
Dane	395,703	2,730,130	18,398	931,264	1,465,759
Dodge	318,255	2,267,718	25,082	620,375	911,492
Door.....	12,420	34,608	4,386	1,792	22,377
Douglas	238	10	.....	.....	690
Dunn	41,434	208,679	9,971	72,883	262,033
Eau Claire	34,973	208,241	4,228	67,277	286,534
Fond du Lac.....	287,707	1,610,362	13,742	284,535	976,669
Grant	288,691	897,635	5,833	1,822,486	1,509,025
Green	257,304	525,190	25,568	937,696	731,180
Green Lake	96,994	586,185	15,057	252,916	297,611
Iowa.....	170,147	767,875	4,336	689,211	829,470
Jackson.....	35,217	218,922	8,427	74,866	259,009
Jefferson	232,284	676,825	32,254	571,530	473,161
Juneau	51,593	194,048	15,373	120,890	196,263
Kenosha	141,730	205,746	13,325	272,919	332,198
Kewaunee	31,607	122,149	21,151	839	75,146
La Crosse	77,288	573,826	22,279	197,423	290,668
La Fayette	204,683	523,985	45,617	1,317,510	1,318,116
Manitowoc	128,649	519,931	93,742	4,903	378,840
Marathon	11,706	36,027	1,478	100	76,609
Marquette.....	60,885	143,559	77,436	116,787	78,510
Milwaukee	89,127	238,630	41,125	172,190	311,839
Monroe	74,734	469,531	14,746	183,666	292,682
Oconto	10,649	23,992	2,826	2,780	27,241
Outagamie	75,935	353,187	2,978	56,331	199,956
Ozaukee	84,311	311,903	70,229	28,006	247,117
Pepin.....	20,923	97,905	4,774	109,485	80,118
Pierce	44,858	325,978	2,560	81,638	175,198
Polk	9,715	40,778	378	11,117	50,631
Portage.....	61,079	210,139	59,309	64,022	152,143
Racine *	83,163	166,246	3,570	145,816	134,749

* No returns from the towns of Dover, Burlington, Norway, Rochester and Waterford.

TABLE of *Agricultural and Manufacturing Productions*—continued.

COUNTIES.	IMPROVED LANDS.	WHEAT.	RYE.	CORN.	OATS.
	No. Acres.	Bushels.	Bushels.	Bushels.	Bushels.
Richland	70,974	188,676	8,204	342,717	182,190
Rock	318,261	882,851	120,741	1,121,529	1,150,246
St. Croix	101,369	769,908	1,634	59,344	414,085
Sauk	137,082	487,001	24,374	419,752	499,576
Shawano.....	7,877	27,012	3,252	8,006	27,746
Sheboygan	158,914	570,665	90,824	126,651	425,374
Trempealeau ...	66,674	516,664	10,130	147,550	246,196
Vernon	94,967	526,098	2,759	272,424	436,136
Walworth.....	212,975	611,809	40,703	785,700	702,145
Washington....	147,549	714,094	76,192	208,761	398,507
Waukesha	220,172	646,244	72,716	521,529	501,095
Waupaca	58,753	192,745	24,393	102,915	111,775
Waushara	59,099	142,673	61,480	143,247	72,268
Winnebago	152,937	791,803	8,190	189,845	407,212
Wood	6,516	6,518	7,448	14,526	15,390
Totals	5,795,538	25,323,647	1,356,736	14,875,968	19,878,794

TABLE of *Agricultural and Manufacturing Productions*—continued.

COUNTIES.	BARLEY.	WOOL.	POTATOES	BUTTER.	CHEESE.
	Bushels.	Pounds.	Bushels.	Pounds.	Pounds.
Adams.....	2,479	28,193	62,960	268,150	8,719
Ashland			530	295	
Barron	100	160	1,980	4,975	
Bayfield			550	50	
Brown	4,753	12,341	68,479	328,622	
Buffalo	45,711	28,264	65,600	263,435	19,320
Burnett	86	273	1,928	5,995	
Calumet	12,557	31,415	40,038	297,513	2,600
Chippewa	8,872	3,857	26,654	28,754	
Clark	880	1,664	15,403	65,051	
Columbia	49,504	230,771	204,426	702,985	30,532
Crawford	7,193	23,892	80,333	239,939	
Dane	148,003	251,947	345,852	1,229,226	37,938
Dodge	102,399	234,836	354,298	1,181,564	15,643
Door	1,647	589	43,013	56,292	
Douglas	140		1,601		
Dunn	25,935	8,562	55,098	204,155	730
Eau Claire	22,185	5,015	28,779	124,285	100
Fond du Lac	59,493	270,590	251,425	1,118,361	60,793
Grant	51,933	76,326	290,013	955,947	4,870
Green.....	17,102	141,309	280,393	907,295	330,135
Green Lake	16,731	119,423	89,659	351,456	83,560
Iowa.....	37,216	48,668	143,732	555,181	3,892
Jackson.....	16,728	6,736	38,753	140,724	350
Jefferson.....	50,193	199,915	296,498	914,693	74,502
Juneau	4,586	27,025	105,264	220,200	3,420
Kenosha	46,870	243,852	135,356	456,407	290,280
Kewaunee	5,920	5,193	56,215	120,644	270
La Crosse	18,291	27,199	68,690	240,637	18,165
La Fayette	64,712	66,254	192,358	681,591	22,260
Manitowoc	30,155	51,963	109,018	578,106	4,412
Marathon	3,273	4,328	22,096		53
Marquette	233	49,974	68,217	227,458	1,290
Milwaukee	54,433	13,261	214,558	622,573	13,006
Monroe	10,451	38,753	103,449	391,518	8,920
Oconto	177	605	35,625	43,620	
Outagamie	3,006	34,799	66,725	282,704	17,610
Ozaukee	37,533	15,892	83,486	395,379	17,019
Pepin	7,409	7,950	26,917	127,535	1,400
Pierce	25,201	10,078	46,879	120,160	800
Polk	1,217	1,926	16,138	70,059	
Portage	6,197	25,987	115,976	199,517	7,692
* Racine.....	17,426	81,566	94,868	358,878	625
Richland	2,631	67,476	108,505	322,140	17,244
Rock	206,204	261,705	450,442	1,039,592	65,975
St. Croix	26,971	3,331	62,220	262,712	900
Sauk	22,443	59,994	209,699	506,171	14,299

* No returns from the towns of Dover, Burlington, Norway, Rochester and Waterford

TABLE of *Agricultural and Manufacturing Productions*—continued.

COUNTIES	BARLEY.	WOOL.	POTATOES	BUTTER.	CHEESE.
	Bushels.	Pounds.	Bushels.	Pounds.	Pounds.
Shawano .....	.....	1,943	20,256	21,345	100
Sheboygan	56,427	134,240	139,057	710,088	85,565
Trempealeau	16,957	38,523	47,653	341,068	7,613
Vernon	23,532	61,600	74,504	482,428	1,835
Walworth	114,590	419,873	278,750	599,505	81,325
Washington	64,549	57,165	186,692	638,304	3,980
Waukesha	57,417	297,269	407,638	859,827	63,035
Waupaca	3,770	35,702	97,458	276,191	5,043
Waushara	733	45,532	90,213	319,297	8,814
Winnebago	11,442	170,059	91,510	749,187	57,811
Wood	493	875	28,418	47,243	.....
Totals	1,627,569	4,086,638	6,642,845	22,257,117	1,494,145

TABLE of *Agricultural and Manufacturing Productions*—continued.

COUNTIES.	HAY.	HOPS.	Estimated Value of all Farm Productions.	Value of Manufactures Produced.
	Tons.	Pounds.		
Adams.....	10,160	204,020	\$607,058	\$158,149
Ashland	37	.....	2,150	.....
Barron	401	.....	22,715	.....
Bayfield.....	15	.....	725	21,000
Brown	19,283	2,420	830,692	2,159,392
Buffalo	16,409	130	1,374,010	466,025
Burnett	1,671	.....	22,125	.....
Calumet	12,367	14,700	734,703	130,684
Chippewa.....	6,936	200	164,966	1,345,113
Clark	3,435	4	207,042	109,048
Columbia	44,129	229,215	3,637,692	586,026
Crawford	11,961	13,982	823,551	240,548
Dane	74,369	51,915	5,483,047	1,121,563
Dodge	71,001	68,644	4,650,389	2,064,848
Door.....	1,910	.....	183,092	428,969
Douglas.....	77	.....	510	118,373
Dunn	11,921	7,910	667,255	1,027,593
Eau Claire	5,721	4,600	446,620	1,439,365
Fond du Lac.....	76,637	50,131	3,572,433	3,359,876
Grant	39,379	41,265	3,515,049	1,039,841
Green.....	42,850	11,150	2,557,799	1,081,300
Green Lake.....	30,392	22,780	1,481,132	723,265
Iowa.....	37,485	72,541	2,294,373	1,069,629
Jackson	6,957	3,950	461,465	365,650
Jefferson	48,848	298,027	2,793,724	2,298,027
Juneau.....	15,271	535,281	684,610	818,828
Kenosha	43,956	6,640	1,460,336	1,266,443
Kewaunee.....	5,065	165	433,302	361,057
La Crosse	15,388	180,622	2,885,261	1,149,501
La Fayette	40,433	6,340	2,758,935	677,513
Manitowoc	26,744	1,200	1,450,271	1,561,579
Marathon	2,791	.....	149,581	672,960
Marquette.....	20,213	24,390	697,162	155,878
Milwaukee	24,737	12,115	1,654,863	18,838,783
Monroe	20,627	442,938	1,258,992	867,270
Oconto	3,547	.....	225,854	2,085,961
Outagamie	18,962	4,800	1,788,224	2,529,222
Ozaukee	14,357	8,400	963,900	765,933
Pepin	6,549	7,410	273,354	185,515
Pierce	7,257	.....	583,631	209,375
Polk.....	3,218	.....	173,072	54,890
Portage	9,612	70,074	643,757	522,942
Racine*.....	26,333	9,300	908,668	3,174,825
Richland.....	17,327	341,467	1,092,166	310,566
Rock	51,878	12,335	4,124,637	3,395,781
St. Croix.....	7,253	9,400	1,003,132	796,518
Sauk	29,784	1,274,563	1,274,553	779,025

* No returns from the towns of Dover, Burlington, Norway, Rochester and Waterford.

TABLE of *Agricultural and Manufacturing Productions*—continued.

COUNTIES.	HAY.	HOPS.	Estimated Value of all Farm Productions.	Value of Manufactures Produced.
	Tons.	Pounds.		
Shawano	1,673	1,100	\$152,953	\$290,785
Sheboygan	39,424	39,039	2,086,651	1,748,339
Trempealeau	18,823	24,250	832,178	170,748
Vernon	19,879	97,200	1,405,562	470,765
Walworth	50,488	125,555	2,677,356	1,074,278
Washington	22,492	10,633	1,916,503	1,061,824
Waukesha	58,840	74,209	2,785,538	774,142
Waupaca	14,814	104,674	734,049	464,929
Waushara	13,646	40,247	787,101	260,897
Winnebago	51,794	175,180	2,377,234	6,312,754
Wood	3,798	1,100	147,734	370,890
Totals	1,280,432	4,738,222	\$77,507,261	\$85,604,966

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Wisconsin state agricultural society.

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Transactions.

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v. 2

MAR 9 - 1939

E. M. Edwards
MAR 24 1939

